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ABSTRACT

This monograph addresses the assumptions underlying a resolution calling for a termination of the use of aversive procedures to modify the behavior of persons with severe disabilities that was passed in 1981 by the Executive Board of The Association for Persons with Severe Handicaps. It provides both data and arguments to support the original concerns that led to passage of the resolution, going beyond the analysis of treatment efficiency, although that is included, to address how the history of using aversive procedures might have affected professional attitudes and perceptions towards persons with severe disabilities. The monograph (1) reviews the published studies that have used aversive procedures with persons who are disabled, especially individuals classified as mentally retarded or emotionally disturbed; (2) provides a demographic analysis of persons with disabilities, emphasizing the settings where these studies were conducted and the age of the subjects; (3) addresses issues related to the outcomes of the history of using aversive procedures as they affect both the behavior of the recipients of the procedures and those who use them. Issues raised include comparisons with populations of nondisabled persons, interpretive analyses concerning concepts of depersonalization, and the spread effect of using aversive procedures for questionable target behaviors. Twelve tables detail findings of the literature review; 16 additional tables are appended. (VW)

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# Use of Aversive Procedures with Persons who are Disabled: An Historical Review and Critical Analysis

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Monograph of The Association for Persons with Severe Handicaps Volume 2, No. 1

**Edited by Philippa Campbell**
**With Epilogue by Frank Laski**

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# I. Introduction

In 1981 the Executive Board of The Association for Persons with Severe Handicaps (TASH) passed a resolution calling for a termination of the use of aversive procedures to modify the behavior of persons with severe disabilities. This resolution was, in part, a response to the perceived misuse of aversive procedures in classrooms and other treatment settings throughout the country. The resolution at that time was controversial among members of the Association. Still today the use of aversive procedures with persons who have severe disabilities provides an area of intense debate among researchers and direct-service providers. Additionally, there are real concerns among many members of our Association that aversive procedures continue to be used widely (and, in some cases, routinely) with persons who have severe handicaps. Many practitioners may not even be aware of the TASH resolution that was adopted six years ago. Other persons, aware of the resolution, have not agreed with it on various grounds.

This monograph addresses the underlying assumptions of the 1981 resolution and provides both data and arguments to support the original concerns that led to the action taken at that time by the Executive Board. It should be stated that the preparation of this monograph was not authorized by The Association for Persons with Severe Handicaps. It was, in fact, prepared in response to a growing concern of the authors that aversive procedures continue to be used extensively with persons who have severe disabilities and that the perpetuation of this practice must be analyzed, and indeed critiqued, from several new and different perspectives.

In most respects, past discussions on the use of aversive procedures with persons who are disabled have revolved around the effectiveness and efficiency of the procedures when balanced against the types of behavior exhibited by the recipients of the technology. The application of the procedures has been viewed as a necessary means to obtain a positive result wherein the person is made to be less disabled.

The purpose of this monograph is to go beyond the analysis of treatment efficiency (even though this is included), and to address how the history of using aversive procedures might have affected, directly or indirectly, professional attitudes and perceptions towards persons with severe disabilities. This analysis also includes perceptions of persons with disabling conditions by nondisabled community members who, themselves, have witnessed the application of aversive procedures with persons who have been identified as deviating significantly from societal expectations and norms.

The first part of this monograph reviews the published studies that have used aversive procedures with persons who are disabled, especially individuals classified as mentally retarded or emotionally disturbed. The second part provides a demographic analysis of persons with disabilities, with particular emphasis on the settings where these studies were conducted, and the age of the subjects. The remaining parts address issues related to the outcomes of the history of using aversive procedures as they affect both the behavior of the recipients of the procedures and those persons who use them. The issues raised include comparisons with populations of nondisabled persons, interpretive analyses concerning concepts of depersonalization, and the spread effect of using aversive procedures for questionable target behaviors.

The authors recognize that some of the content and interpretive analyses of this monograph will themselves be "aversive" to some readers. Inevitably the decision to prepare this monograph reflects our own biases concerning these practices. Nevertheless, we have endeavored to set our biases aside and to present a scholarly discussion of the issues involved and our rationale for raising them. We believe that our field has matured to the point where honest disagreements pertaining to existing practices can occur and where dialogue is not only desirable, but necessary. Indeed, the real danger of the possible abuse and misuse of aversive procedures with persons who are disabled might not come from those who advocate their use, but from others who failed to question, criticize, or otherwise raise the level of awareness about what has happened and continues to take place.

## Definitions

The types of aversive procedures reviewed in the following pages are punishment, negative reinforcement, and overcorrection. Definitions of these procedures are provided below along with examples of stimuli and procedures for each as described in the literature. These three procedures are reviewed not because they are necessarily more aversive than other techniques

such as response cost, timeout, and extinction, but because they involve the use of stimuli that are undeniably unpleasant.

*Punishment.* Punishment is the presentation of stimulus contingent upon the occurrence of a behavior that decreases the rate of occurrence of that behavior (Sulzer-Azaroff & Mayer, 1986). Stimuli presented following the behavior are unpleasant and are referred to as punishers. Greene and Hoats (1971) and Bailey (1983) divide punishers into the following types: (a) electrical stimulation; (b) aversive drug reaction; (c) stimulus satiation; (d) covert sensitization; (e) aversive auditory stimulation, which includes verbal reprimands; (f) aversive smells; (g) aversive tastes; (h) aversive physical sensations; and (i) distortion of visual stimuli.

*Negative reinforcement.* Negative reinforcement consists of unpleasant (aversive) stimuli that, when removed contingent upon a behavior, result in the maintenance of or increase in the rate of occurrence of that behavior (Sulzer-Azaroff & Mayer, 1986). The unpleasant events are referred to as negative reinforcers. Examples of negative reinforcers are electric shock, pinching, and physical restraint.

*Overcorrection.* Overcorrection is a set of procedures consisting of two major components—restitution and positive practice—"that are applied either singly or in combination, depending on the nature of the target behavior" (Foxx & Bechtel, 1983). Restitution is the correction of the consequence of the behavior, such as restoring the environment to its pre-behavior state. Positive practice is the extensive performance of the appropriate behavior for interacting with the environment.

Examples of restitutional overcorrection are: required relaxation for aggression toward oneself, others, or the environment; and picking up and straightening furniture that has been overturned. Examples of positive practice overcorrection include functional body movements as an alternative to self-stimulatory behavior, and affectionate patting of individuals as an alternative to aggression toward them.

# II. Evaluation of Aversive Procedures

The following section evaluates the application of three aversive procedures—punishment, negative reinforcement, and overcorrection—to the behavior of persons with disabling conditions. The evaluation criteria that follow are based, in part, on those used in previous reviews of aversive procedures (Forehand & Baumeister, 1976; Kazdin & Wilson, 1978).

In the present review, each aversive procedure is evaluated in terms of the following factors:

1. *Effectiveness* of the procedure for changing behavior as measured by percentage of change.
2. *Efficiency* as measured by time needed to effect a change in behavior, duration of the treatment method, and ease of implementation.
3. *Maintenance* of effects for an extended period of time after treatment conditions are removed.
4. *Generalization* of effects to nontreatment conditions or to nontarget behaviors.
5. *Side effects* resulting from treatment. Side effects are defined as: (a) positive or negative changes in nontargeted behavior(s) of the subject or others that result directly from the treatment; and (b) other unanticipated outcomes of treatment.
6. Acceptability of *experimental designs*. Acceptable designs are control group or single subject designs such as withdrawal, reversal, multiple baseline, changing criterion, and multiple treatment (e.g., alternating treatment, multiple schedule) (cf. Kazdin, 1982). A withdrawal or reversal design is acceptable if it includes a minimum of three phases (ABA or BAB, where A is baseline and B is intervention) (Hersen & Barlow, 1976, p. 176; Kazdin, 1982, p. 119; Tawney & Gast, 1984, p. 195). A multiple baseline design is acceptable if it is conducted across at least three conditions (Hersen & Barlow, 1976, p. 227; Tawney & Gast, 1984, p. 227). Particular attention in the review is given to the occurrence of order effects of multiple treatments and to whether intervention consists of a single treatment or of a treatment package. Treatment packages, while of practical value, may belie the effectiveness of the individual treatments (i.e., punishment, negative reinforcement, or overcorrection) that are the objects of this review. Similarly, order effects confound the interpretation of effectiveness of the individual treatments (Kazdin, 1982, p. 172).

### Evaluation of Punishment Procedures

Tables 1-6 in the appendix summarize 38 published studies representing 49 experiments (some articles contained several experiments) and 117 subjects. A list of the published studies, grouped by category of the target behavior, is contained in Table 1 that follows. These studies represent the total number of articles published in 16 professional journals (see Table 2 in the text) between 1965 and 1984 that used punishment procedures with persons classified as mentally retarded, multiply disabled (e.g., blind and mentally retarded), developmentally disabled, schizophrenic, psychotic, autistic, or emotionally disturbed. The organization of Tables 1-6 in the appendix is an adaptation of tables used by Foxx and Bechtel (1983) in their review of overcorrection procedures. Tables 1-6 of the appendix form the basis for the following analysis of punishment procedures.

*Effectiveness in changing behavior.* Table 7 in the appendix summarizes the effectiveness of treatment data from Tables 1-5 (behavior reduction studies). As shown in Table 7 of the appendix, punishment procedures alone reduced behavior by 90%-100% for 45% of the subjects, and by 70%-89% for 8% of the subjects. Punishment either increased the target behavior or reduced it by less than 70% for 14% of the subjects. Punishment combined with other techniques effectively reduced behavior by 90%-100% for 21% of the subjects, by 70%-89% for 4% of the subjects, and increased behavior in 7% of the subjects.

Punishment also was used in two studies to develop adaptive behaviors of discrimination, attention, and word recognition (see Table 6 in the

## Table 1

### Studies Reviewed in the Evaluation of Punishment Procedures

**Toileting**

Tough, Hawkins, McArthur, & Van Ravenswaay (1971)

**Stereotyped**

Baumeister & Forehand (1972)
Koegel & Covert (1972)
Foxx & Azrin (1973)
Koegel, Firestone, Kramme, & Dunlap (1974)
Romanczyk (1977)
Reid, Tombaugh, & Heuvel (1981)
Friman, Cook, & Finney (1984)
Reilich, Spooner, & Rose (1984)

**Self injury**

Tate & Baroff (1966)
Yeakel, Salisbury, Greer, & Marcus (1970)
Corte, Wolf, & Locke (1971)
*Greene & Hoats (1971)
Tate (1972)
Griffin, Locke, & Landers (1975)
Romanczyk & Goren (1975)
Tanner & Zeiler (1975)
Altman, Haavik, & Cook (1978)
Anderson, Dancis, & Alpert (1978)
Baumeister & Baumeister (1978)
Favell, McGimsey, & Jones (1978)
Murphey, Ruprecht, Baggio, & Nunes (1979)
Dorsey, Iwata, Ong, & McSween (1980)

**Inappropriate oral**

Luckey, Watson, & Musick (1968)
Kohlenberg (1970)
Sajwaj, Libet, & Agras (1974)
Becker, Turner, & Sajwaj (1978)
Blount, Drabman, Wilson, & Stewart (1982)
Singh & Bakker (1984)

**Aggression-disruption**

Birnbrauer (1968)
Risley (1968)
Greene & Hoats (1971)
Conway & Bucher (1974)
Salzberg & Napolitan (1974)
Doleys, Wells, Hobs, Roberts, & Cartelli (1976)
Cook, Altman, Shaw, & Blaylock (1978)
Fonagy & Slade (1982)

**Adaptive behavior**

Massey & Insalaco (1969)
Kircher, Pear, & Martin (1971)

*Listed twice.

appendix). In these studies, incorrect responses or inattention were punished, while correct responses or attention to task were reinforced.

In both studies, learning or performance increased while the rate of incorrect responding or inattention decreased.

Five studies compared punishment with other behavior reduction methods. Two of these (Doleys, Wells, Hobbs, Roberts, & Cartelli, 1976; Singh & Bakker, 1984) found punishment to be slightly more effective than overcorrection or timeout. One study (Foxx & Azrin, 1973) found overcorrection to be better than punishment (slap or distasteful solution); another study (Fonagy & Slade, 1982) found white noise used as a negative reinforcer to be more effective than when used as a punisher; and Anderson Dancis, and Alpert (1978) found timeout, differential reinforcement of other behavior (DRO), and timeout plus DRO all to be more effective than shock.

In summary, punishment used singly or in combination with other procedures effectively reduces a variety of target behaviors under many different treatment conditions. One must keep in mind, however, that relying only on published articles greatly inflates the perceived effectiveness of the techniques. In our experience, it is likely that most research showing negative or weak results is neither published nor even submitted for review for publication.

*Efficiency.* Efficiency is defined by at least three factors: (a) length of time needed to suppress or

## Table 2
## List of Professional Journals Reviewed for Punishment Procedures with Persons who had Disabling Conditions

American Journal of Mental Deficiency (1965-1984)
Analysis and Intervention in Developmental Disabilities (1981-1984)
Behavior Modification (1978-1984)
Behavior Research and Therapy (1965-1984)
Behavior Therapy (1965-1984)
Journal of Applied Behavior Analysis (1968-1984)
Journal of Autism and Developmental Disorders (1971-1984)
Journal of Behavior Therapy and Experimental Psychiatry (1974-1984)
Journal of Clinical Psychology (1965-1984)
Journal of Experimental Child Psychology (1965-1984)
Journal of Experimental Research and Personality (1965-1984)
Journal of Special Education (1965-1984)
Mental Retardation (1973-1984)
The American Association for the Education of the Severely/Profoundly Handicapped Review (1976-1979)*
The Journal of The Association for the Severely Handicapped (1980-1984)*
Journal of Consulting and Clinical Psychology (1965-1984)

*Changed to The Journal of The Association for Persons with Severe Handicaps in 1983.

(accelerate) behavior; (b) duration of the treatment procedure; and (c) ease of conducting the procedures. The length of time needed to alter a target behavior was determined by multiplying the length of treatment sessions by the number of sessions needed to suppress behavior (see Table 7 of the appendix). This number represents the total time of observation, monitoring, and/or treatment, and not the number of times punishment occurred. In some cases (such as with electric shock), only a small number of treatments needed to be administered.

The time required to alter behavior: (a) was 176 hours for the single toileting study reviewed; (b) ranged from 3.3 to 72 hours, with a mean of 67 hours per subject for studies addressing inappropriate oral behavior; (c) ranged from .6 to 30 hours, with a mean of 4 hours per subject for studies on stereotyped behavior; (d) ranged from .2 to 150 hours, with a mean of 15 hours per subject for studies of aggression-disruption; (e) ranged from .2 to 150 hours, with a mean of 9 hours per subject for studies of self injury; and (f) ranged from 2.3 to 6 hours, with a mean of 4 hours per subject for adaptive behavior studies.

A review of Tables 1-6 in the appendix indicates that in terms of duration of the treatment procedures, most lasted from one second or less to five seconds. These treatments consisted of shock, ammonia inhalant, water mist, lemon juice, or tickling. Longer treatments ranged from 7 seconds (scolding and silent glare) to 5 minutes (restraint).

While most treatments were easy to administer they did require materials or equipment such as ammonia, shock device, water mister, oral solution, ice, shaving cream, or white noise apparatus. The materials and equipment for some treatments (shock, white noise, distasteful solutions) required calibration and/or testing before each session.

In summary, most punishers were easy to administer and were delivered for short duration. A significant proportion of research used materials or technical equipment. The time required to alter behavior varied substantially, with shorter treatment periods required for stereotyped, self-injurious, and adaptive behaviors.

*Maintenance of effects.* Table 8 in the appendix summarizes the maintenance data reported in Tables 1-6. Of the 38 punishment studies, 17 (45%

of the studies, 16% of the subjects) contained maintenance information. Of these 17, 10 contained data-based maintenance information and 4 were anecdotal reports. Three studies did not indicate if the information was data-based or anecdotal. The self-injurious behavior category had the greatest percentage (77%) of studies reporting on maintenance of effects.

Of the studies with maintenance information, 71% reported that treatment effects were durable. The length of the follow-up period was 12 months or less in 71% of the studies, and 18 months or less in 82%. Three (18% of studies) had longer follow-up periods (21 to 36 months).

In summary, approximately one-third of the studies examined durability of effects. The majority found effects to be durable in the short term, with few investigations of durability beyond an 18-month period.

*Generalization.* Table 9 of the appendix summarizes the generalization data reported in Tables 1-6. Of the 38 punishment studies, 15 (39% of the studies, 29% of the subjects) had information on generalization. Of these 15, 11 contained data-based information on generalization, and 3 were anecdotal reports. One report did not indicate whether the information was anecdotal or data-based. Of the studies reporting generalization, 47% (7 studies) found some generalization, 47% found no generalization, and 1 study (6%) had mixed results. Of the seven studies finding generalization of effects, results transferred to other settings in five instances; to persons, time periods, or behaviors in two instances each; and to other tasks in one instance (some studies reported several forms of generalization).

In summary, less than half of the research addressed generalization of effects. Most generalization conditions were described only briefly in the studies, making it difficult to ascertain the variables responsible for generalization results.

*Side effects.* Table 10 in the appendix summarizes the data from Tables 1-6 on side effects. Of the 38 punishment studies, 27 (71%) reported information on side effects. From these 27 studies came 17 data-based reports on side effects, 10 positive and 7 negative, and 25 anecdotal reports, 13 positive and 12 negative (some studies reported both positive and negative side effects or both data-based and anecdotal information). The positive side effects reported most often were spontaneous increases in learning, performance, or other adaptive behaviors; and a verbal warning or other less intrusive stimulus becoming a conditioned punisher for suppressing behavior. Negative side effects reported most often were increases in the target behavior at onset of treatment. Others were emotional responses, resistance, and avoidance behavior.

Few studies included side effects as a major component of investigation. Of the data-based side effects reported, most were recognized because they were a direct outcome of the treatment (e.g., initial increase in target behavior, weight gain) rather than a specific investigation of the question of side effects. Little attention was given to correlate emotional and performance variables of the subject, experimenter, or others present. Nor did many studies investigate side effects as a function of type of disabling condition, history of treatment, function of the behavior that was treated (e.g., stimulation, communication), environmental conditions (e.g., stress, deprivation), type of treatment, or treatment parameters such as duration or intensity.

*Experimental design.* The single punishment study for toileting behavior was unacceptable in terms of design, using an AB design (A = baseline, B = treatment) with a treatment package (cold bath, DRO, verbal reprimand, and so on). Three of the six studies that targeted inappropriate oral behavior had acceptable designs (ABAB or alternating treatments), and investigated a single treatment (lemon juice, restraint, overcorrection). The remaining studies were inadequate due to their design (AB or multiple baseline across only two conditions).

Three of eight studies of stereotyped behavior used an acceptable multiple baseline design across three settings or an ABA design and only one treatment (water mist, physical restraint). Three other studies included acceptable ABA or ABAB designs but used treatment packages consisting of two punishers ("No" plus a slap or physical restraint). The remaining two studies used unacceptable designs (e.g., AB, multiple baseline across two conditions) or were confounded by order effects (e.g., ABCAB).

In the aggressive-disruptive behavior category, there were no studies that investigated a single treatment and were of an acceptable design. Two studies had adequate designs (ABA, ABABAB) but used treatment packages of two punishers ("No" plus restraint, scolding plus a silent glare). All other studies in this category were inadequately designed (AB, multiple baseline across two conditions) or confounded by order effects (e.g., ABCAD).

Two studies of self-injury contained no description of the experimental design. Of the remaining studies, two contained at least one experiment that was adequately designed (ABAB, multiple baseline across four conditions) and used a single treatment (water mist, shock). Three studies contained at least one experiment with adequate design (ABA, BAB) but used treatment packages

consisting of a punisher and a nonpunishment intervention (shock plus response prevention, water squirt plus reinforcement, restraint plus distraction). The remaining seven studies were inadequately designed (AB) or confounded by order effects (ABCAC, ACAD).

In the adaptive behavior category, one study used a single treatment within an ABAB design. Two treatment packages also were studied using adequate experimental designs. One package (reinforcement plus white noise) was studied within a control group design; the second package (reinforcement plus "No" plus shock) was within an alternating treatment design.

Overall, less than 25% of the research was adequately designed, investigated a single treatment, and was free from order effects. When treatment packages are included, this figure increases to 48% of the total number of the punishment studies.

### Evaluation of Negative Reinforcement Procedures

Table 11 in the appendix summarizes the studies in the journals listed in Table 1 in the text that were published between the years 1965 and 1985 and that used negative reinforcement procedures. There were a total of four such studies that contained five experiments and used five subjects. All four studies used negative reinforcement to teach adaptive behavior.

*Effectiveness in changing behavior.* Negative reinforcement was effective in that it increased task-initiated responding from 0 to 70 responses a minute (Mithaug & Hanawalt, 1977); doubled or tripled the proportion of eye contact time (Altman & Krupsaw, 1982); and immediately increased responding to command from 0% to 60%-90%, and, increased social contacts from 0% to 90%-100% (Lovaas, Schaeffer, & Simmons, 1965). All experiments involved treatment packages (reinforcement plus restraint, shock plus "No") with the exception of the Mithaug and Hanawalt (1977) study.

Three studies compared treatments and/or treatment packages. Mithaug and Hanawalt (1977) found finger pressure to be more effective than hand tapping or verbal cues. Restraint plus reinforcement was found by Altman and Krupsaw (1982) to be more effective than just reinforcement. Mithaug (1978) found comparable rates of responding but less self injury when the treatment package of reinforcement, one hand in pocket, and an intermittent schedule of finger pressure was compared to the package consisting of reinforcement, response prevention, and finger pressure. More research is needed before an adequate assessment can be made of negative reinforcement procedures.

*Efficiency.* The time required to increase behavior varied greatly across the three studies that showed changes in adaptive behavior. In two studies (Altman & Krupsaw, 1982; Lovaas et al., 1965), change occurred immediately and during relatively short sessions, with the time needed to effect a change ranging from 20 to 30 minutes. Although change occurred immediately in the third study (Mithaug & Hanawalt, 1977), it required a mean of 14 sessions (20-40 minutes each), the equivalent of 5.8 hours, to achieve a mean rate of 69 responses per minute.

The duration of the treatment procedures ranged from three to five seconds in the two studies (Altman & Krupsaw, 1982; Lovaas et al., 1965) where this factor was described. In terms of the care of implementing negative reinforcement procedures, the shock procedure (Lovaas et al., 1965) is extremely difficult to establish, test, monitor, and administer in applied settings. All the other negative reinforcement techniques used could be implemented readily.

*Maintenance of effects.* Only one of the four studies (Lovaas et al., 1965) reported follow-up information. The data-based results indicated that at 10 months the two subjects had maintained their high rate of responding to command and to physical contact, and maintained their freedom from stereotyped and tantrum behavior.

*Generalization.* Three of the four studies reported generalization information. Data-based reports indicated effects generalized to another person (Mithaug, 1978; Mithaug & Hanawalt, 1977). Anecdotal information in the Lovaas et al. (1965) study indicated that responses to command and physical contact generalized to nontreatment settings and persons, but were not maintained beyond a few months.

*Side effects.* All four studies reported on side effects of treatment. Data-based reports indicated that the finger pressure method was effectively implemented by others (Mithaug & Hanawalt, 1977), adaptive behavior development resulted in 100% reduction in self injury or aggression (Mithaug, 1978; Mithaug & Hanawalt, 1977), and "No" became a conditioned punisher after being paired with shock (Lovaas et al., 1965). One data-based report (Mithaug, 1978) found the subject to be unmanageable during one finger pressure condition.

Anecdotal reports indicated subjects were more alert, affectionate, and happier as a result of treatment (Lovaas *et al.*, 1965). Anecdotal reports

indicated also that subjects were initially fearful and immobilized by shock (Lovaas et al., 1965), and that escape and emotional behaviors accompanied restraint (Altman & Krupsaw, 1982).

*Experimental design.* Only one study used a single treatment (Mithaug & Hanawalt, 1977). A modified alternating treatment design was used with order of treatment partially counterbalanced. One other study (Altman & Krupsaw, 1982) used an acceptable design (multiple baseline across four tasks) to study a treatment package (reinforcement plus restraint), which was confounded by order effects.

### Evaluation of Overcorrection

Foxx and Bechtel (1983) provide a comprehensive review of overcorrection procedures in the treatment of toileting, stereotyped behavior, inappropriate oral behavior, aggression-disruption, self-injury, and educational-social development. The following analysis is based on the Foxx and Bechtel (1983) review that included overcorrection studies published between 1971 and 1981 in the journals listed in Table 3 of the text. Included in the analysis that follows are those studies in the Foxx and Bechtel chapter that used subjects with disabilities. Excluded are studies with persons without disabilities or adults with mental illness. There were 66 such studies involving 247 subjects, the greatest proportion of whom (174 subjects, 70%) were classified as severely or profoundly mentally retarded. The 66 studies selected from Foxx and Bechtel (1983) for this review are listed in Table 4 of the text.

*Effectiveness in changing behavior.* Based upon the Foxx and Bechtel (1983) review, overcorrection procedures were highly effective in treating a wide range of behaviors within the behavior reduction treatment categories of toileting (incontinence, nocturnal enuresis, encopresis), stereotyped behavior, inappropriate oral behavior, aggression-disruption, and self injury. As can be seen in Table 12 of the appendix, overcorrection alone reduced target behaviors by 90% to 100% in 31 (57%) of 54 studies involving 133 (63%) of the 210 subjects, and by 80%-89% in two (4%) studies that involved 7 (3%) subjects. Overcorrection was highly effective also when combined with other behavior reduction techniques. In studies that used overcorrection in combination with one or more other procedures (reinforcement, satiation, differential reinforcement of other behavior, differential reinforcement of incompatible behavior, verbal warning), target behaviors were reduced 90% to 100% in 13 (24%) studies using 40 (19%) subjects.

Overcorrection has been used also to increase the adaptive behavior (e.g., class attendance, eye contact, compliance, sharing) of persons with disabilities. Foxx and Bechtel (1983) report seven such behavior improvement studies, all of which showed substantial increases in adaptive behavior.

The bottom portion of Table 12 of the appendix summarizes the studies that compared two or more behavior reduction procedures. These studies only *suggest* that overcorrection is more effective than certain other procedures. As Foxx and Bechtel (1983) point out, every one of these studies had one or more of the following methodological problems: (a) failure to control for sequence effects; (b) decreasing baselines; (c) inclusion of the comparison treatment in the baseline; (d) inadequate description of reinforcement procedures; and (e) unequal amount of treatment under comparison conditions. No adequately designed comparison has ever been conducted (Foxx & Bechtel, 1983).

In summary, overcorrection used either singly or in combination with other procedures effectively decelerates a wide variety of target behaviors, in many different settings, and with persons who differ in terms of type and severity of disability.

*Efficiency.* Table 13 of the appendix summarizes the information in the Foxx and Bechtel (1983) review that relates to length of time needed to suppress target behaviors and to duration of the treatment procedure. The top portion of Table 13 shows the length of time (in hours) needed in order for the treatment to achieve maximum effectiveness (as reported in Table 12 of the appendix). Although there were tremendous differences in the number of hours required (1-480), most studies required 1-50 hours, with a mean of 17 hours for stereotyped behavior, 52 for inappropriate oral behavior, 33 hours for aggression-disruption, 35 for self injury, and 190 for toileting. No data were available for adaptive behavior. There was no difference in length of treatment required when overcorrection was used alone, in combination with other procedures, or when compared to other procedures. Within treatment categories, there was variation in type of subject, target behavior, and type and integrity of overcorrection procedures. There were no obvious differences across these variables in terms of length of treatment required.

In the bottom half of Table 13 of the appendix is a summary of the length of time needed to execute each instance of the overcorrection procedures as reported by Foxx and Bechtel (1983). The length of overcorrection procedures ranged from .05-140 minutes, with a mean of 8 minutes

## Table 3
## Journals Reviewed in the Foxx and Bechtel (1983) Analysis of Overcorrection Procedures

American Journal of Mental Deficiency
Behavior Modification
Behavior Research and Therapy
Child Behavior Therapy
Journal of Abnormal Child Psychology
Journal of Applied Behavior Analysis
Journal of Autism and Developmental Disorders
Journal of Behavior Therapy and Experimental Psychiatry
Journal of Clinical Psychology
Journal of Experimental Child Psychology
Journal of Mental Deficiency Research
Journal of Pediatric Psychology
Mental Retardation
Psychological Reports
The American Association for the Education of the Severely/Profoundly Handicapped Review*
The Journal of The Association for the Severely Handicapped*
Vocational Evaluation and Work Adjustment Bulletin

*Changed to The Journal of The Association for Persons with Severe Handicaps in 1983.

for stereotyped behaviors, 21 for inappropriate oral behavior, 20 for aggression-disruption, 40 for self injury, 36 for toileting, and 10 minutes for adaptive behavior. The shorter durations of overcorrection for stereotyped and adaptive behavior categories resulted from the type of procedure used (movement training or positive practice). All other categories required such time-consuming training as household orderliness, oral hygiene, or required relaxation.

In terms of ease of use, overcorrection procedures are difficult to implement. The procedures are complex and require that staff be trained and monitored in their use (Foxx & Bechtel, 1983). The procedures are inappropriate for use with students who are physically strong and resistive.

In summary, overcorrection procedures are efficient in that they suppress behavior rapidly. The procedures are effective when implemented for a short duration (one to five minutes) immediately following the target behavior. However, in many cases the duration may have to be longer (5 - 120 minutes) in order to be effective. The procedures are usable for all but physically strong and resistive students.

*Maintenance of effects.* Table 14 of the appendix summarizes the maintenance data reported by Foxx and Bechtel (1983). Of the 66 studies, 35 (53% of the studies, 49% of the subjects) contained information on maintenance. Of these 35, 24 contained data-based information related to the maintenance of treatment effects, 10 were anecdotal reports, and 1 did not indicate whether it was data based or anecdotal. Of the studies reporting maintenance information, 94% indicated that treatment effects were maintained. The length of the follow-up period was six months or less in 66% of the studies, and 12 months or less in 94%.

In summary, one-half of the research addressed the issue of maintenance, with almost all of the reports limited to a follow-up period of one year or less. In many cases, descriptions of follow-up conditions were poor, making it difficult to distinguish maintenance from generalization issues.

*Generalization.* A summary of generalization information reported by Foxx and Bechtel (1983) is presented in Table 15 of the appendix. Of the 66 studies of overcorrection, 21 (32% of the studies, 13% of the subjects) contained general-

## Table 4

### Studies from Foxx and Bechtel (1983) that were Used in this Review

**Toileting**

Azrin & Foxx (1971)
Azrin, Sneed, & Foxx (1973)
Freeman & Pribble (1974)
Doleys & Arnold (1975)
Smith, Britton, Johnson, & Thomas (1975)
Butler (1976)

**Stereotyped**

Foxx & Azrin (1973)
Azrin, Kaplan, & Foxx (1973)
Epstein, Doke, Sajwaj, Sorrel, & Rimmer (1974)
Kissel & Whitman (1977)
Martin, Weller, & Matson (1977)
Rollings, Baumeister, & Baumeister (1977)
Wells, Forehand, Hickey, & Green (1977)
Wells, Forehand, & Hickey (1977)
Doleys & Wells (1978)
Luiselli, Pemberton, & Helfen (1978)
Ollendick, Matson, & Martin (1978)
Coleman, Whitman, & Johnson (1979)
Matson, Ollendick, & Martin (1979)
Roberts, Iwata, McSween, & Desmond (1979)
Barrett & Shapiro (1980)
Cohen, Mayhew, & Clemens (1980)
Denny (1980)
Higgs, Burns, & Meunier (1980)
Shapiro, Barrett, & Ollendick (1980)

**Self injury**

Azrin, Gottlieb, Hughart, Wesolowski, & Rahn (1975)
Barnard, Christophersen, & Wolf (1976)
Harris & Romanczyk (1976)
Measel & Alfieri (1976)
Kelly & Drabman (1977a)
Kelly & Drabman (1977b)
deCatanzaro & Baldwin (1978)
Zehr & Theobald (1978)
Clements & Dewey (1979)
Rose (1979)
Agosta, Close, Hops, & Rusch (1980)
Conely & Wolery (1980)

**Inappropriate oral**

Azrin & Wesolowski (1975a)
Foxx & Martin (1975)
Duker & Seys (1977)
Matson, Stephens, & Smith (1978)
Simpson & Sasso (1978)
Drabman, Cordua y Cruz, Ross, & Lynd (1979)
Foxx, Snyder, & Schroeder (1979)

**Agression-disruption**

Foxx & Azrin (1972)
Azrin & Armstrong (1973)
Webster & Azrin (1973)
Azrin & Wesolowski (1974)
Azrin & Powers (1975)
Azrin & Wesolowski (1975b)
Foxx (1976b)
Doleys, Wells, Hobbs, Roberts, & Cartelli (1976)
Rusch, Close, Hops, & Agosta (1976)
Luiselli, Helfen, Pemberton, & Reisman (1977)
Carroll, Sloop, Mutter, & Prince (1978)
Shapiro (1979)
Adams (1980)
Durana & Cuvo (1980)
Polvinale & Lutzker (1980)

**Adaptive behavior**

Foxx (1976a)
Foxx (1977)
Wehman, Schutz, Renzaglia, & Karan (1977)
Barton & Osborne (1978)
Matson, Esveldt-Dawson, & O'Donnell (1979)
Ollendick, Matson, Esveldt-Dawson, & Shapiro (1980)
Carey & Bucher (1981)

ization information. Of these 21, 12 contained data-based information on the generalization of treatment effects, and 9 contained anecdotal information. Of the studies reporting on generalization, 80% indicated some degree of generalization for at least some of the subjects. Nontreatment settings were used most often (in 69% of the studies) to indicate generalization. The next most frequently used indicator was nontarget behaviors.

In summary, one-third of the research addressed generalization, with half of these being anecdotal reports. In most cases, generalization was measured in only a small number of nontreatment conditions.

*Side effects.* A summary of the side effects reported by Foxx and Bechtel (1983) is presented in Table 16 of the appendix. Of the 66 total studies, 28 (42%) reported data-based or anecdotal information on side effects. In these 28 articles, side effects were reported to be positive in 6 studies, negative in 10 studies, and both positive and negative in 12 studies.

The positive side effects reported most often were increases in nontargeted adaptive behaviors, increases in attention or interaction with other persons or materials, and increases in the behaviors incorporated into the positive practice phase of overcorrection. Negative side effects reported most often were increases in nontargeted inappropriate behaviors, increases in emotional or aggressive behaviors, and resistance to the overcorrection procedures.

Overcorrection, like other aversive procedures, is capable of producing positive and negative side effects. Further analysis of the Foxx and Bechtel (1983) data indicates that this is true regardless of the type of behavior treated (e.g., adaptive responses, aggression-disruption, self injury).

*Experimental design.* None of the six studies that treated toileting behavior used an adequate treatment design. Experimental designs consisted, instead, of AB, ABC, or B designs.

Of the seven studies in the inappropriate oral behavior category, only one had an acceptable design (ABAB) and a single treatment (overcorrection). One study had an acceptable experimental design (ABA) but used a treatment package (overcorrection plus reinforcement). The remaining studies used unacceptable designs (multiple baseline across two conditions, ABCD) or failed to control for order effects (BCBC, ABC within a multiple baseline).

Nine of the 19 studies that addressed stereotyped behaviors used acceptable experimental designs (ABA, ABAB, multiple baseline, alternating treatment), investigated overcorrection only, and were unconfounded by treatment order effects. Two other studies had acceptable designs but used a treatment package (overcorrection plus reinforcement). The remaining eight studies used unacceptable designs or were confounded by order effects.

Only 2 of 15 studies of aggression-disruption met the criteria for adequate experimental design and control. One of the two studies was a control group design, the other used an ABAB design. The remaining studies used unacceptable designs (AB, ABC) or failed to control for order effects (e.g., BCBC, ABAC, BC within a multiple baseline).

Eight of the 12 studies of self-injury were acceptable. Four of these used a multiple baseline design, three used an ABA or ABAB design, and the eighth study used a changing criterion design. The remaining studies had unacceptable designs (AB) or were confounded by order effects (ABC).

Four of seven studies to increase adaptive behavior had acceptable designs (ABA, ABAB, alternating treatment) and investigated only the overcorrection procedure. One study had an acceptable design but used a treatment package (overcorrection plus reinforcement plus modeling). The remaining two studies had unacceptable designs or were confounded by order effects.

In summary, 36% of the research consisted of adequately designed studies of overcorrection only. Numerous others indicated that overcorrection in combination with, or when used subsequent to, other treatments, was an effective treatment. Only one study used an experimental control group; the remaining investigations consisted of single subject research.

### Evaluation Summary

Published studies that used punishment or overcorrection show that these procedures can, either singly or as part of treatment packages, effectively reduce a wide range of behaviors and increase adaptive behavior. Published studies using negative reinforcement demonstrated the effectiveness of this procedure for increasing adaptive behavior. Unfortunately, effectiveness cannot be assessed fully because research that shows weak or negative results is seldom published.

Effects appear to be durable for short follow-up periods. Most researchers, however, fail to provide follow-up data or else do so but for only 12 months or less. Follow-up conditions in most studies are described poorly.

Most researchers failed to provide data on generalization of effects. Of those reporting on generalization, over half found some degree of

## Table 5
### Subject Descriptions from the Published Articles Used for Identifying the Four Populations Categories

**Profound/severe mental retardation:** severely retarded; profoundly retarded; severely handicapped; profoundly retarded/blind; multiply handicapped/emotionally disturbed, deaf/blind, cerebral palsy.

**Moderate/mild mental retardation:** moderately retarded; psychomotor retarded; severely moderate mental retardation; developmentally delayed; retarded.

**Autistic/emotionally disturbed:** autistic; emotionally disturbed; severely emotionally disturbed; autistic/mental retardation; paranoid schizophrenic; schizophrenics; psychotic blind; severely disturbed/mental retardation; autistic/severely retarded.

**Other:** neglected, blind, normal.

transfer of effects. Typically, generalization was measured in these instances in only a subset of possible conditions to which effects must transfer in applied settings.

Side effects were reported for all three aversive procedures. These effects appeared to be balanced in terms of being negative or positive.

Adequate experimental designs were present in a relatively small number of studies. This situation was evident, across all target behaviors, although understandable in cases treating self injury or severe stereotyped behavior.

# III. Demographic Analyses of Published Studies

The previous section has reviewed and discussed published studies related to the effectiveness of aversive procedures used with persons with disabling conditions. This discussion included initial alteration of the behavior, efficiency, maintenance, generalization, side effects (positive and negative), and experimental design of the studies. The review, as well as other recent publications (cf. Axelrod & Apsche, 1983; Matson & Dilorenzo, 1984; Wood & Lakin, 1978) suggests that aversive procedures have been used extensively with persons who are disabled, and that many practitioners favor the continued application of these procedures to modify the behavior of this population.

One area that has been neglected in the literature is an examination and demographic analyses of what types of procedures have been used in relation to the type and severity of disabling conditions, the behaviors that were being modified, the age of the individuals involved in the studies, and the settings in which the investigations were conducted. A recent study by Knowlton (1985) surveyed these demographic variables as described in published articles that were included in 16 prominent journals between the years 1965 and 1984. Table 2 from Section II lists the journals that were reviewed for this analysis.

As a point of clarification, the demographic analysis reported in the Knowlton (1985) study was done independent of the study reported in Section II and did not include all of the journals from the Foxx and Bechtel (1983) review of overcorrection procedures (as listed earlier in Table 3). As such, there is not an exact correspondence between either the journals or published investigations that were reviewed. In both studies, however, attempts were made to provide a reasonable and representative sampling of the published literature.

**Area of Analysis**

For each journal article reviewed in the Knowlton (1985) study, information was tabulated on: type of aversive procedure used; description of the subject population; type of behavior targeted for remediation; chronological ages of the subjects; and settings where the studies were conducted.

*Aversive procedures used.* The three types of aversive procedures identified for the survey were punishment, negative reinforcement, and overcorrection. Definitions for these procedures have been provided earlier in this monograph. It should be noted that in all the published studies reviewed, positive reinforcement procedures were used in combination with the application of aversive procedures.

*Subject populations.* For purposes of analysis, subject populations were grouped as follows: Profound/Severe Mental Retardation; Moderate/Mild Mental Retardation; Autism/Emotionally Disturbed; and Other. Inconsistencies in description of subject populations in the published articles made it virtually impossible to provide additional subcategories. In some articles, descriptions of subjects did not totally and accurately reflect titles of the publications and, in many articles, subject descriptions were not sufficiently detailed. As a compromise, the labels used most consistently in the articles were identified for purposes of grouping the subject categories. These descriptors, for each of the subject categories, are provided in Table 5. It is recognized that in reality there likely exists overlap between the population categories, especially given the 19-year span in which the articles were published. Nevertheless, the relatively broad categories used in the analysis incorporate subjects with similar levels and types of disabling conditions.

*Target behaviors.* Categorization of target behaviors reported in the published articles was arrived at through consultation with classroom teachers and university faculty members in the Department of Special Education at The University of Kansas. Categories of target behaviors included: stereotyped/self stimulation; self-injurious behavior; aggression towards others; aggression towards environment; disruptive; compliance/on-task behavior; skill development; and other. A list of the behaviors from the published studies for each of the eight categories is presented in Table 6.

The published articles frequently used category descriptions identical to those in Table 6 to describe the target behaviors for remediation. Some subjects exhibited two or more behaviors, usually within the same categories.

*Chronological ages.* Three age categories were included in the analysis of published articles using aversive procedures: 0-6; 7-21; and over 21. These age groupings were selected to correspond to periods in which most states provide formal educational opportunities for persons with disabilities (7-21) and the life years on either side of

## Table 6

### Categories of Target Behaviors Described in Published Journal Articles Using Aversive Procedures

**Stereotyped/self-stimulation**

- repetitive mouthing
- self-stimulatory speech
- mouthing hand/objects
- body rocking
- clapping
- touched/pinched face and neck
- finger movements
- body rocking
- hand movements
- playing with doors
- staring out of windows
- thumbsucking
- puts objects over face (coats, papers, shirts)
- turns head in wide arc side to side
- handtouching—rapid hand clapping
  - hand jabbing
  - finger jabbing
- bruxism
- echolalic speech
- public masturbatory responses
- grimacing

**Self-injurious behavior**

- slapping face/slapping self
- eye poking
- hitting face on floor
- poking tongue
- pluck out hair/hairpulling
- chewing/biting fingers
- hand biting
- head banging
- tear flesh from lip and forearm
- arm bites
- choking self
- wrist biting
- hit face with fists
- hit eyes with fists
- kick objects with legs
- eye gouging
- self-destructive
- kicking themselves
- vomiting
- rumination

**Agression towards others**

- biting other children
- hitting others
- aggressive comments
- pulling hair
- pinching
- scratching

**Aggression towards environment**

banging on walls and furniture
stamping feet, whining

**Disruptive**

grabbing tokens
attempting to leave room
disruptive aggression
table hitting
pica
growling
climbing high places
grabbing
disrobing
tantrums

**Compliance/on-task behavior**

inattentive behavior in picture naming task
noncompliant behavior
compliance to sorting task
compliance to collating task
avoid eye contact with training stimuli and therapists
out of seat
increase eye contact

**Skill development**

visual discrimination learning
teaching manual signs

**Other**

nocturnal enuresis
hallucinations

## Table 7

### A Listing of 61 Published Articles, Showing the Procedures Used and the Types of Aversive Stimuli that were Employed

| Punishment | Aversive stimuli |
|---|---|
| Tate & Baroff (1966) | restraint, electric shock |
| Birnbrauer (1968) | electric shock |
| Risley (1968) | electric shock |
| Luckey, Watson, & Musick (1968) | electric shock |
| Massey & Insalaco (1969) | white noise at 95 db |
| Kohlenberg (1970) | electric shock |
| Yeakel, Salisbury, Greer, & Marcus (1970) | electric shock |
| Corte, Wolf, & Locke (1971) | electric shock |
| Kircher, Pear, & Martin (1971) | electric shock; slap on hand |
| Tough, Hawkins, McArthur, & Van Ravenswaay (1971) | placed in bathtub of cold water |
| Greene & Hoats (1971) | contingent tickling beneath the arms |
| Tate (1972) | electric shock |
| Baumeister & Forehand (1972) | electric shock |
| Koegel & Covert (1972) | slap on hand |
| *Foxx & Azrin (1973) | slap on thigh |
| Sajwaj, Libet, & Agras (1974) | lemon juice into mouth |
| Conway & Bucher (1974) | shaving cream into mouth |
| Salzberg & Napolitan (1974) | physical restraint |
| Koegel, Firestone, Kramme, & Dunlap (1974) | slapping; restraint |
| Griffin, Locke, & Landers (1975) | hair tugs; electric shock |
| Romanczyk & Goren (1975) | electric shock |
| Tanner & Zeiler (1975) | ammonia capsule under nose |
| Doleys, Wells, Hobbs, Roberts, & Cartelli (1976) | loud reprimand; silent glare |
| Romanczyk (1977) | slap to hand |
| Anderson, Dancis, & Alpert (1978) | electric shock |
| Baumeister & Baumeister (1978) | ammonia capsule under nose |
| Becker, Turner, & Sajwaj (1978) | lemon juice into mouth |
| Favell, McGimsey, & Jones (1978) | lemon juice into mouth |
| *Simpson & Sasso (1978) | lemon juice into mouth |
| Altman, Haavik, & Cook (1978) | ammonia capsule under nose |
| Cook, Altman, Shaw, & Blaylock (1978) | lemon juice into mouth |

| | |
|---|---|
| Murphey, Ruprecht, Baggio, & Nunes (1979) | water squirted to face |
| Dorsey, Iwata, Ong, & McSween (1980) | water mist to face |
| Reid, Tombaugh, & Heuvel (1981) | physical restraint |
| Blount, Drabman, Wilson, & Stewart (1982) | ice on cheeks, chin |
| Fonagy & Slade (1982) | white noise at 80 db |
| Friman, Cook, & Finney (1984) | water spray to face; vinegar, lemon juice to mouth |
| Reilich, Spooner, & Rose (1984) | water mist to face |
| *Singh & Bakker (1984) | physical restraint |

| **Negative Reinforcement** | **Aversive Stimuli** |
|---|---|
| Lovaas, Schaeffer, & Simmons (1965) | electric shock |
| Mithaug & Hanawalt (1977) | finger/thumb pressure on arm |
| Mithaug (1978) | finger/thumb pressure to neck |
| Altman & Krupshaw (1982) | held face |

| **Overcorrection** | **Aversive Stimuli** |
|---|---|
| *Foxx & Azrin (1973) | teeth/gums brushed with oral antiseptic; forced body movement |
| Azrin, Kaplan, & Foxx (1973) | forced body movement |
| Foxx & Azrin (1974) | forced body movement |
| Foxx (1976) | clothing restitution |
| Kelly & Drabman (1977) | forced body movement |
| Foxx (1977) | forced body movement |
| Luiselli, Pemberton, & Helfen (1978) | forced body movement |
| deCantanzaro & Baldwin (1978) | forced body movement |
| *Simpson & Sasso (1978) | forced to swallow vomitus |
| Rose (1979) | forced body positions |
| Roberts, Iwata, McSween, & Desmond (1979) | forced body movement |
| Harris & Wolchik (1979) | forced body movement |
| Shapiro, Barrett, & Ollendick (1980) | forced body movement |
| Conley & Wolery (1980) | forced body movement |
| Luce, Delquadri, & Hull (1980) | contingent exercise |
| Borreson (1980) | forced body movement |
| Agosto, Close, Hops, & Rush (1980) | brush teeth with oral antiseptic |
| Higgs, Burns, & Meunier (1980) | forced body movement |
| Hinerman, Jenson, Walker, & Petersen (1982) | forced body movement |
| Singh, Manning, & Argell (1982) | teeth brushed and face wiped with listerine |
| *Singh & Bakker (1984) | oral hygiene; resfitution |

*Used both punishment and overcorrection procedures.

this range. The mean age of the subjects was recorded for analysis in the few publications that reported group studies.

*Settings where studies were conducted.* Settings where the studies were conducted created another difficult problem in categorization. In some cases, a one or two word description was provided without elaboration. For purposes of categorization, the labels provided in the published articles were used without always knowing exactly the types of services provided in the settings, or whether they were live-in arrangements. Accordingly, there is likely some overlap in the categories that were selected for analysis. These categories included the following:

(a) *Institutional* (residential, nursing facility, neuropsychiatric hospital);
(b) *Preschool* (also described as day care); *Public School; Clinic; Home;*
(c) *University* (classrooms and experimental units); *Special School;* and *Other* (sheltered workshop, pediatric institute, medical center, group homes, and community mental health children's unit).

### Review of Aversive Procedures Used

A total of 61 published articles that used aversive procedures with persons with disabilities were identified in the review of the journals. These articles are identified in Table 7, with descriptions of the procedures used (i.e., punishment, negative reinforcement, overcorrection) and the types of aversive stimuli that were employed.

As shown in Table 7, the majority of published studies using electrical shock as a punisher were conducted in the late 1960's and early 1970's. A variety of other aversive stimuli gradually replaced the published use of electrical shock as punishers. These included water sprays to the face, substances placed in the mouth, ammonia capsules placed under the nose, ice placed to the cheeks, white noise, slaps, hair tugs, and physical restraint.

There were only four articles reporting the use of negative reinforcement procedures with persons with disabling conditions, including the Lovaas *et al.* (1965) article that used an electric shock grid as a negative reinforcer to increase social interactions.

Published articles reported by Foxx and Azrin (1973) and Azrin, Kaplan, and Foxx (1973) used overcorrection procedures. These publications were followed by a large number of articles using these "new" procedures. Forced body movements (involving various body parts) were the most commonly used aversive stimuli, followed by teeth/gum brushing with oral antiseptics. Forcing a child with rumination to swallow his vomitus, followed by lemon juice into the mouth (Simpson & Sasso, 1978), offered a variation to the typical overcorrection procedures reported in the literature.

The next level of analyses concentrated on the demographic variables described in the 61 published articles, and defined in an earlier section. For purposes of analyses, data are reported as studies because many of the published articles reported in Table 7 included two or more separate studies that varied in treatment procedures, aversive stimuli, subject populations, and age categories. These variations are reported in footnotes to the tables representing the demographic variables. A more complete analysis of the demographic data is found in Knowlton (1985).

### Type of Aversive Procedure Used with Different Subject Populations

Table 8 presents the three types of aversive procedures (punishment, negative reinforcement, overcorrection) in relation to population categories. As might be expected, the subjects described as having profound/severe mental retardation were identified most often as recipients of all three aversive procedures. These persons were, in fact, included in the overwhelming majority of studies, followed by persons with autism/emotional disturbance, and individuals with moderate/mild mental retardation. The "other" category (neglected, blind, normal) had few reported studies. Punishers were reported most frequently as the aversive procedure of choice across population categories.

### Type of Aversive Procedure Used in Relation to Target Behaviors

The type of aversive procedure used in relation to the eight categories of target behaviors is shown in Table 9. As can be observed in these data, attempts to reduce stereotyped/self-stimulation behavior were reported in 10 studies that used punishers, and in 9 studies using overcorrection procedures. Nineteen studies using punishers and 6 studies that employed overcorrection procedures were directed at self-injurious behavior. Overall, 19 studies were directed at stereotyped/self-stimulation behavior and 25 studies attempted to reduce self-injurious behavior.

Studies for reducing stereotyped/self-

## Table 8

### Type of Aversive Procedure Used with Different Subject Populations

| Aversive Procedure | Population Category | Studies # | Studies % | Subjects # | Subjects % |
|---|---|---|---|---|---|
| **Punishment** | Profound/severe M.R. | 23 | 61 | 89 | 79 |
| | Moderate/mild M.R. | 5 | 13 | 6 | 5 |
| | Autistic/emotional disturbed | 8 | 21 | 15[a] | 13 |
| | Other | 2 | 5 | 2 | 2 |
| | TOTAL | 38 | | 112 | |
| **Negative Reinforcement** | Profound/severe M.R. | 2 | 50 | 2 | 40 |
| | Moderate/mild M.R. | 1 | 25 | 1 | 20 |
| | Autistic/emotional disturbed | 1 | 25 | 2 | 40 |
| | Other | 0 | 0 | 0 | 0 |
| | TOTAL | 4 | | 5 | |
| **Over-correction** | Profound/severe M.R. | 13 | 59 | 33[b] | 69 |
| | Moderate/mild M.R. | 3 | 14 | 3 | 6 |
| | Autistic/emotional disturbed | 5 | 23 | 11 | 23 |
| | Other | 1 | 5 | 1 | 2 |
| | TOTAL | 22 | | 48 | |
| | OVERALL TOTALS | 64[c] | | 165 | |

[a]Overcorrection was also used.

[b]Punishment was also used.

[c]Four articles were counted twice because there were two different populations. One article was not counted because there was no population given.

stimulation behaviors used the following punishers: electric shock (Baumeister & Forehand, 1972); slapping to body parts (Foxx & Azrin, 1973; Koegel & Covert, 1972; Koegel *et al.*, 1974; Romanczyk, 1977); physical restraint (Reid *et al.*, 1981; Salzberg & Napolitan, 1974); sprays to the face (Friman *et al.*, 1984; Reilich *et al.*, 1984); and lemon juice or vinegar into the mouth (Cook *et al.*, 1978; Friman *et al.*, 1984).

Electric shock was used as a punisher in nine studies to reduce self-injurious behavior (Anderson *et al.*, 1978; Corte *et al.*, 1971; Griffin *et al.*, 1975; Kohlenberg, 1970; Luckey *et al.*, 1968; Romanczyk & Goren, 1975; Tate, 1972; Tate & Baroff, 1966; Yeakel *et al.*, 1970). The use of ammonia capsules was used in three studies (Altman *et al.*, 1978; Baumeister & Baumeister, 1978; Tanner & Zeiler, 1975) to reduce self-injurious behavior.

Other punishers to reduce self-injurious behavior included lemon juice into the mouth (Becker *et al.*, 1978; Favell *et al.*, 1978; Sajwaj *et al.*, 1974; Simpson & Sasso, 1978); contingent tickling (Greene & Hoats, 1971); restraint (Tate & Baroff, 1966); and water mist to the face (Murphey *et al.*, 1979).

Forced body movements were used in nine studies to reduce stereotyped behavior via overcorrection procedures (Azrin *et al.*, 1973; Foxx & Azrin 1973, 1974; Harris & Wolchik, 1979; Higgs *et al.*, 1980; Luiselli *et al.*, 1978; Roberts *et al.*, 1979; Shapiro *et al.*, 1980). The use of overcorrection procedures to reduce self-injurious behavior included forced body movement (Borreson, 1980; Conley & Wolery, 1980; deCatanzaro & Baldwin, 1978); oral antiseptics (Agosto *et al.*, 1980; Singh *et al.*, 1982); and forced swallowing of vomitus (Simpson & Sasso, 1978).

### Type of Aversive Procedure Used in Relation to Age

Table 10 shows the age category of subjects used for each aversive procedure. These data indicate that persons with disabilities between the ages

## Table 9

### Type of Aversive Procedure Used in Relation to Target Behaviors

| Aversive Procedure | Behavior Category | Studies # | Studies % | Subjects # | Subjects % |
|---|---|---|---|---|---|
| **Punishment** | Stereotyped/self-stimulation | 10 | 26 | 22 | 19 |
| | Self-injurious | 19 | 49 | 36[a] | 32 |
| | Aggression towards others | 2 | 5 | 2[b] | 2 |
| | Aggression towards environment | 0 | 0 | 0 | 0 |
| | Disruptive | 3 | 8 | 3 | 3 |
| | Compliance on task | 2 | 5 | 5 | 4 |
| | Skill Development | 1 | 3 | 40 | 35 |
| | Other | 2 | 5 | 5 | 4 |
| | TOTAL | 39 | | 113 | |
| **Negative Reinforcement** | Sterotyped/self-stimulation | 0 | 0 | 0 | 0 |
| | Self-injurious | 0 | 0 | 0 | 0 |
| | Aggression towards others | 0 | 0 | 0 | 0 |
| | Aggression towards environment | 0 | 0 | 0 | 0 |
| | Disruptive | 0 | 0 | 0 | 0 |
| | Compliance on task | 3 | 75 | 3 | 60 |
| | Skill Development | 1 | 25 | 2 | 40 |
| | Other | 0 | 0 | 0 | 0 |
| | TOTAL | 4 | | 5 | |
| **Over-correction** | Stereotyped/self-stimulation | 9 | 45 | 30[c] | 63 |
| | Self-injurious | 6 | 30 | 9 | 19 |
| | Aggression towards others | 1 | 5 | 2 | 4 |
| | Aggression towards environment | 0 | 0 | 0 | 0 |
| | Disruptive | 2 | 10 | 3 | 6 |
| | Compliance on task | 1 | 5 | 3 | 6 |
| | Skill development | 1 | 5 | 1 | 2 |
| | Other | 0 | 0 | 0 | 0 |
| | TOTAL | 20 | | 48 | |
| | OVERALL TOTALS | 63[d] | | 166 | |

[a]Overcorrection was also used.

[b]Also exhibited was aggression towards environment and was counted twice because there were two target behaviors.

[c]A punishment was also used.

[d]One article was counted twice because there were two target behaviors.

of 7 and 21 were involved most frequently in studies using punishment or overcorrection procedures. Children from 0-6 constituted the second largest category in studies using punishers. The 0-6 and over 21 categories were almost identically represented in studies using overcorrection procedures, but both categories were significantly lower than the 7-21 age range for this aversive procedure.

### Type of Aversive Procedure Used in Relation to Settings

Table 11 shows the eight identified settings where the three types of aversive procedures were used. As shown in these data, the largest percent of studies using punishers were conducted in institutional settings. Ten of the thirteen studies identified as using electric shock for a punisher were conducted in an institutional setting

## Table 10

### Type of Aversive Procedure Used in Relation to Age

| Aversive Procedure | CA | Studies # | Studies % | Subjects # | Subjects % |
|---|---|---|---|---|---|
| **Punishment** | 0-6 | 14 | 32 | 17 | 15 |
| | 7-21 | 25 | 57 | 85[a] | 76 |
| | 21 | 5 | 11 | 10 | 9 |
| | TOTAL | 44 | | 112 | |
| **Negative Reinforcement** | 0-6 | 2 | 50 | 3 | 60 |
| | 7-21 | 2 | 50 | 2 | 40 |
| | 21 | 0 | 0 | 0 | 0 |
| | TOTAL | 4 | | 5 | |
| **Over-correction** | 0-6 | 5 | 21 | 7 | 15 |
| | 7-21 | 13 | 54 | 24 | 50[b] |
| | 21 | 6 | 25 | 17 | 35 |
| | TOTAL | 24 | | 48 | |
| | OVERALL TOTALS | 72[c] | | 165 | |

[a]Overcorrection was also used.

[b]Punisher was also used.

[c]Eleven articles were counted twice because there were two different ages using the same punisher. One article was counted three times because there were three different ages using the same punisher. Two articles were not recorded because no age was given.

(Baumeister & Forehand, 1972; Birnbrauer, 1968; Corte *et al.*, 1971; Griffin *et al.*, 1975; Kircher *et al.*, 1971; Kohlenberg, 1970; Luckey *et al.*, 1968; Risley, 1968; Tate, 1972; Tate & Baroff, 1966). Electric shock punishment was used by Yeakel *et al.* (1970), Anderson *et al.* (1978), and Becker *et al.* (1978) in medical center clinics. Romanczyk and Goren (1975) used electrical shock in a special school. The largest percent of studies using overcorrection procedures were also conducted in an institutional setting, followed closely by preschool settings.

### Summary of Results

A summary of the 61 published articles using aversive procedures with persons who are disabled shows the following major findings.

1. Punishment has been used most extensively of the three aversive procedures followed closely by overcorrection. The number of published articles reporting the use of punishers decreased following the appearance of overcorrection procedures in 1973. Negative reinforcement procedures have been reported infrequently in the published literature.
2. All three aversive procedures were used most frequently with persons with profound/severe mental retardation. Persons identified as autistic/emotionally disturbed were the second most commonly identified subject population.
3. Stereotyped/self-stimulation and self-injurious behaviors were targeted most frequently for punishment and overcorrection procedures. Punishers were used most often for self-injurious behavior, while overcorrection was used slightly more often with stereotyped/self-stimulation behavior. A variety of other behaviors also were targeted for aversive procedures.
4. The most frequent age range for the use of aversive procedures was

## Table 11
### Type of Aversive Procedure Used in Relation to Settings

| Aversive Procedure | Settings | Studies # | Studies % | Subjects # | Subjects % |
|---|---|---|---|---|---|
| **Punishment** | Institution | 21 | 57 | 86 | 78 |
| | Preschool | 1 | 3 | 1 | 1 |
| | Public school | 4 | 11 | 7[a] | 6 |
| | Clinic | 2 | 5 | 6 | 5 |
| | Home | 3 | 8 | 6 | 5 |
| | University | 0 | 0 | 0 | 0 |
| | Special school | 3 | 8 | 1 | 1 |
| | Other | 3 | 8 | 3 | 3 |
| | TOTAL | 37 | | 110 | |
| **Negative Reinforcement** | Institution | 0 | 0 | 0 | 0 |
| | Preschool | 0 | 0 | 0 | 0 |
| | Public school | 1 | 25 | 1 | 20 |
| | Clinic | 0 | 0 | 0 | 0 |
| | Home | 0 | 0 | 0 | 0 |
| | University | 2 | 50 | 2 | 40 |
| | Special school | 0 | 0 | 0 | 0 |
| | Other | 1 | 25 | 2 | 40 |
| | TOTAL | 4 | | 5 | |
| **Over-correction** | Institution | 8 | 40 | 23 | 48 |
| | Preschool | 6 | 30 | 16[b] | 33 |
| | Public school | 1 | 5 | 2 | 4 |
| | Clinic | 0 | 0 | 0 | 0 |
| | Home | 0 | 0 | 0 | 0 |
| | University | 1 | 5 | 1 | 2 |
| | Special school | 0 | 0 | 0 | 0 |
| | Other | 4 | 20 | 6 | 13 |
| | TOTAL | 20 | | 48 | |
| | OVERALL TOTALS | 61[c] | | 163 | |

[a]Overcorrection was also used.

[b]Punishment was also used.

[c]One article was counted twice because there were two different populations. One article was not counted because there was no setting given.

between 7 and 21 years. The remaining two age categories, 0-6, and over 21 were almost equally divided in relation to application of aversive procedures.

5. Institutions were the most commonly identified setting for application of aversive procedures, especially punishers. Preschool settings ranked a close second in published studies using overcorrection procedures.

# IV. Use of Aversive Stimuli and Procedures With Disabled and Nondisabled Populations

Past and present applications of aversive procedures to people who have disabling conditions present a complicated situation. There are, for example, pressing human needs: first, to provide treatment programs to people whose behavior is especially disabling and complicates their underlying disabilities; and second, to advance knowledge and its application. There are, as well, confounding forensic considerations, including the legal protection of people who are disabled, the motivations of researchers and therapists, and the varying and often disputed ethical and moral viewpoints on the use of aversive therapies. In connection with the needs to treat and to acquire knowledge and all of the forensic considerations, a critical question is the extent to which persons with mentally disabling conditions are apt to be subjected to aversive procedures as a result of their behavioral characteristics and the settings in which they often reside.

An attempt will be make to analyze this question in the discussion that follows. This discussion will include comparisons to other people on whom aversive procedures have been used extensively, and it will set out possible reasons why the use of aversive procedures has continued with persons who are disabled for over a 20-year period. Necessarily, this analysis will include, in part, a brief discussion of the role of science as an important historical influence in this practice, as well as legal challenges that have emerged. Interwoven in this analysis and discussion will be concerns of how the continued application of aversive procedures with persons who are mentally disabled might, over time, influence negatively a wider range of practices with, and perceptions towards, this minority population.

The issues to be addressed, and the concerns about prior and present practices using aversive procedures are, indeed, complex, emotionally charged, and certainly debatable. This discussion is not intended to reflect negatively on persons who adhere to the practice and principles of behavioral psychology. To the contrary, some behaviorists have expressed similar concerns about the application of aversive procedures to persons with disabilities (cf. Evans & Meyer, 1985).

## Analogies to Other Populations

*Different motivations, similar aversive stimuli.* Behavior therapies are used pervasively. They are conscious or unconscious components of child rearing, and they are in most cases conscious components of the education of children, whether disabled or not. Indeed, aversive therapies themselves are components of parental and educator child development practices (Friedman, 1975). They also are important ingredients in interventions with adults who are not disabled. Despite these similarities, there are distinct differences in the types of aversive stimuli used as part of the aversive procedures with people who are disabled when compared to those used with people who are not.

For example, the type of aversive stimuli used as part of the procedures with children and adults who are disabled correspond closely to similar stimuli used occasionally with some adult political prisoners. Table 12 presents two lists of aversive stimuli. List 1 shows the variety of aversive stimuli used with persons with disabling conditions, as reported earlier in this monograph.

List 2 reports aversive stimuli used in the torture of political prisoners, as reported by Amnesty International, 1984.

Obviously, the motivations for applying the aversive stimuli are markedly different with respect to persons who are disabled and political prisoners, and the intensity of the aversive stimuli used on political prisoners frequently is much more severe. Electric shock, for example, is often applied to the genital and other sensitive areas of political prisoners.[1] Additionally, a variety of other unpleasant stimuli (e.g., beatings) are used on political prisoners (Amnesty International, 1984).

There is, nevertheless, a similarity in the topographies of some aversive stimuli used with persons who are disabled and the treatment of political prisoners as reported by Amnesty International. Some would defend the benevolent and altruistic use of aversives and argue that the severity of the behavior problems presented by persons with disabilities warrants their use; that, indeed, such measures are mild when compared to the injury that some persons with disabilities inflict upon themselves and others (Baer, 1971). This issue will be addressed in a later section per-

[1] Tough *et al.* (1971) do, however, refer to a study by Crosby (1950; not referenced) in which electric shock was applied to the genital area as a punishment for nocturnal enuresis.

## Table 12

### Types of Aversive Stimuli Used with Persons who are Disabled and with Political Prisoners

| | List 1 | List 2 |
|---|---|---|
| 1. | Electric shock | Electric shock |
| 2. | Slaps to hands, thighs, etc. | |
| 3. | Ice on cheeks, chin, under chin | |
| 4. | Gums/teeth brushed with antiseptics | |
| 5. | Forced body movements | |
| 6. | White noise at 95 db | |
| 7. | Forced exercise | Strenuous physical exercise |
| 8. | Contingent tickling | |
| 9. | Hair pulling | Hair pulling |
| 10. | Ammonia capsule under nose | |
| 11. | Pinching | |
| 12. | Water squirted in face | High pressure water squirted in mouth |
| 13. | Forced to swallow vomitus | Forced to eat excrement |
| 14. | Lemon juice squirted into mouth | Hot pepper inserted into body orifices (mouth, nose, anus) |
| 15. | Placed in bathtub of cold water | Plunged into ice water |
| 16. | Verbal reprimand | Verbal abuse |
| 17. | Holding posture/physical restraint | Enforced standing |
| | **Population:** Persons with disabling conditions | **Population:** Political prisoners |
| | **Source:** Professional journals | **Source: Torture in the Eighties.** (1984). London: Amnesty International Publications. |

taining to perceptions of "deviancy" and the possible misapplication of aversive procedures to certain behaviors.

*Similar motivations, different aversive stimuli.* There are two other populations on whom aversive procedures have been used extensively—psychiatric patients and criminal offenders.

In the late 1960's and early 1970's extensive studies and experiments by behavior analysts were conducted with criminal offenders, both in and outside of correctional facilities. Nietzel (1979) provides an excellent review of this research, which included token economies and the application of aversive procedures. Aversive procedures included chemically based punishers such as administration of the drug succinylcholine (a muscle relaxer that causes brief suppression of breathing) and the use of "aversion therapy." As defined by Rachman and Teasdale (1969), "aversion therapy is an attempt to associate an undesirable behavior pattern with unpleasant stimulation or to make the unpleasant stimulation a consequence of the undesirable behavior. In either case it is hoped that an acquired connection between the behavior and the unpleasantness will develop" (p. 280).

Aversion therapy used both chemical and electrical stimuli and was applied to a wide range of offenses, including theft, assault, drug abuse, and sexual deviations (fetishes, voyeurism, exhibitionism, rape, pedophilia) (Franks, 1969; Nietzel, 1979).

The application of behavior therapy approaches using aversive procedures (punishers, aversion conditioning) as well as reinforcement-based contingency management programs in prisons, psychiatric hospitals, and, to a lesser extent, institutions for individuals with mental retardation produced major legal controversies, adverse public reactions, and concern by behaviorists themselves.

### Legal Challenges

As Turnbull *et al.* (1986) pointed out in their ethical analysis of aversive interventions, legal challenges to the use of aversive therapies originated in three cases, involving respectively residents of a state mental retardation institution, a psychiatric patient, and prisoners. In *Wyatt u. Stickney (1972)*, behavior modification involving the use of aversive or noxious stimuli was allowed if approved by a human rights committee, given with the consent of the resident or guardian, and administered by a qualified mental retardation professional. In the other cases,

the administration of drugs that induced vomiting (*Knecht v. Gillman, 1973*, involving a psychiatric maximum security hospital) and reduced breathing (*Mackey v. Procunier, 1973*, involving convicts) allegedly violated the persons' rights of consent and against cruel and unusual punishment (guaranteed by the Eighth Amendment).

Wyatt and Knecht make it clear that the first question is whether the person or authorized representative has given legally effective consent. To give such consent, the party must be legally competent to do so, sufficiently informed concerning the procedure, and act voluntarily (Friedman, 1975; Michigan Law Review, 1976; Shapiro, 1974; Southern California Law Review, 1972; Turnbull, 1978). There are times, however, when legally effective consent will not authorize an intervention. Thus, some courts have regarded some procedures as inherent violations of a person's constitutional rights (*Kaimowitz v. Department of Mental Health, 1973*; *Mackey v. Procunier, 1973*), and forbid the procedure on constitutional grounds, apparently believing that one of the three elements of consent is absent or else substituting their judgments and protective instincts for those of the person subjected to the procedure. Those rights are based on several grounds.

The First Amendment explicitly assures the rights of speech, worship, association, privacy, and arguably "mentation" (Shapiro, 1974). Because the amendment's underlying value is personal autonomy (Friedman, 1975; Plotkin, 1978; Schwitzgebel, 1972; Shapiro, 1974; Smith, 1980; Zlotnik, 1981), an intervention that may seriously impair a person's autonomy can violate his/her First Amendment rights, even if he/she has given consent to it (*Knecht v. Gilliam, 1973*).

Regulating aversive or other interventions protects one's autonomy, which is expressed and guaranteed by the constitutional rights of speech and privacy (Friedman, 1975; Shapiro, 1974; Zlotnick, 1981). The doctrines of consent and choice also relate to the expression of a person's autonomy (Turnbull, 1979). Therefore, the use of behavior modification or other interventions that are intended to change one's personality or that have the potential of doing so are highly scrutinized. After all, they can be used to enforce a conformity of behavior; they enable someone to make someone else conform, to be less deviant, or to be more like "us" (Wexler, 1981).

It is this very potential for enforcing conformity that gives rise to two other reasons for the regulation of such therapy. It is that the controlled society—the Utopia of conformity and sameness (Friedman, 1975)—is inconsistent with such democratic liberty-based values as pluralism (Shapiro, 1974; Wexler, 1981) and is fraught with the potential for abuse. The goal-setting power of the therapy and the power relationship that favors the therapist over the client, especially one who is mentally disabled, are for this reason bona fide concerns of civil libertarians and have constitutional implications (Friedman, 1975; President's Commission on Mental Health, 1978).

The due process guarantees of the Fifth and 14th Amendments also shield a client from certain procedures, even when the client has given consent to them. This is so because the Constitution prohibits a state from acting in certain ways (substantive due process) or from acting unless various safeguards have been made available (procedural due process) (Friedman, 1975; Schwitzgebel, 1972; Zlotnick, 1981). The essence of the due process objection is that certain types of behavior modification, psychotropic drugs, electroconvulsive shock therapy, and psychotherapy are so intrusive that a client's Fifth Amendment rights are violated.

The Eighth Amendment's ban on cruel and unusual punishment also has come into play as a barrier to certain procedures. When a procedure has been sufficiently shocking to a court's conscience, as in the case of the administration of drugs that cause a person to regurgitate (*Knecht v. Gillman, 1973*) or lose temporarily the capacity to breathe (*Mackey v. Procunier, 1973*), the intervention has been treated as a cruel and unusual punishment. The fact that the person may have consented to the procedure is disregarded on the theory that the consent was not sufficiently informed or voluntary (Friedman, 1975; *Mackey v. Procunier, 1973*; Schwitzgebel, 1972; Zlotnick, 1981). The prohibition of cruel and unusual punishment reflects a concern that there should be certain standards of humaneness (Friedman, 1975; Shapiro, 1974; Wexler, 1981; Zlotnick, 1981) that must obtain in a civilized society and must therefore be enforced as a matter of constitutional (fundamental) law. While the Eighth Amendment speaks explicitly to a deplorable type of punishment (cruel and unusual), its essential concern is for decent treatment of individuals. Their dignity as humans (Wexler, 1981) seems threatened by techniques developed and perfected on animals, and dehumanization seems too close at hand for both the client and the therapist (Friedman, 1975). The difficulty with applying the Eighth Amendment to aversive interventions on people who are not convicted of crime is that the amendment applies only to punishment for persons convicted of a crime and imprisoned (*Bell v. Wolfish, 1979; Ingraham v. Wright, 430 U.S. 561, 1977; Youngberg v. Romeo, 1982*). Thus, the setting alone—it must be a penal

setting before the Eighth Amendment comes into play—seems to control whether the doctrine of cruel and unusual punishment applies as a matter of federal constitutional law. There is some possibility, however, that state constitutional prohibitions against cruel and unusual punishment may be effective.

The doctrine of the "least drastic means" or "least restrictive alternative" likewise partially restrains the state in use of some aversive procedures. Under this doctrine, a state may not act in a way that is unnecessarily restrictive of a person's freedom (assuming it is warranted in acting at all). The doctrine has been applied to aversive procedures in at least two ways. First, it generally requires that "positive" measures be used before "negative" or "aversive" measures can be used and that, if aversive measures are used, both positive and aversive measures be used simultaneously. Second, it requires the aversive measures be used only in a descending order of restriction; for example, time out procedures would be used before seclusion, and temporary restraints would be used before permanent ones. Under the "least drastic means" doctrine, then, the general legality of the procedures is assumed and only their present use is at issue (Friedman, 1975; *Halderman v. Pennhurst, 1977*; Shapiro, 1974; Turnbull, 1981; Zlotnick, 1981).

Finally, the doctrine of "unconstitutional conditions" may restrain the use of certain interventions. For example, if a procedure may violate the constitutional rights and a client consents to it as a condition of acquiring certain governmental benefits, the consent can be disregarded because the procedure itself is unconstitutional. Thus, if release from lawful confinement in a state facility for psychopathic criminals is conditioned on the inmate's consent to brain surgery that can or likely will impair his intellectual processes (and thereby violate the First Amendment), the surgery will be prohibited (*Kaimowitz v. Department of Mental Health, 1973*).

In addition to these constitutional restraints on aversive procedures, there may also be restrictions imposed by statute, agency regulations, or case law interpreting either or both of them. Several states, by statute, prohibit the use of certain therapies as part of their "patients' rights acts"—for example, electric convulsive shock therapy is regulated by state statute (Tennenbaum, 1983) and, recently, by municipal ordinance (in San Francisco). Likewise, most states have administrative regulations (typically applicable to the mental health and retardation agency) that limit not only what procedures may be used but also by whom, for whom, and under what circumstances (Friedman, 1975; PCMH, 1978; Shapiro, 1974).

There also seems to be a similar sense of "justice" at play in the concerns about behavior modification. It is simply "right" that there be some restraints on what one person or society may do to or for another. Just as administrative convenience or availability of a research population are not themselves justifications for research and must be guarded against so that the burdens and benefits of research will be equitably distributed (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1975), so too must there be special safeguards involving behavioral techniques. Justice requires equalization of treatment and singling out persons with disabilities for unusual treatment is highly suspect, especially when it may affect their autonomy.

In the case of persons with disabilities, the purposes of legal protection are confounded, however, by the very fact of their disability. On the one hand, the law's regulation of aversive or other therapies is intended to conform treatment to certain constitutional doctrines and the common values that are expressed in constitutional doctrines. On the other, there is a very real claim on the client's part to treatment, rehabilitation, cure, habilitation, and the like. As Shapiro (1974) states, the task is to ensure that the "rigorous restraints are placed on any state efforts toward mental 'demolition' masquerading as 'therapy' " without jeopardizing the "plainly admirable goals of curing or arresting severe mental illness—and thereby achieving some measure of benefit to the victim/patient/prisoner, and some measure of public protection and benefit."

The regulation of aversive therapy, therefore, advances the value that individuals should have conditional or qualified opportunities to develop themselves to the limits they choose. The person with disabilities accordingly should have a generously defined right to escape disabilities, to obtain the "liberty" of well-being (Shapiro, 1974). By insisting on consent and applying such doctrines as "least restrictive means" and "unconstitutional condition," the law enables a person with disabilities, up to a point, to acquire therapy that is designed to exorcise the disability; thus, the law does not prohibit all aversive therapy, only its use under certain conditions, namely those that are necessary to protect the individual from the overreaching of the state or his or her own faulty judgment, folly, or impulsiveness.

Another obvious justification for the law's restraints on aversive therapy directly relates to the issue of governmental accountability. Limitations rein in the state by setting boundaries of the acceptable and unacceptable. In a very real sense,

the boundary demarks the line of accountability; if a therapy transcends the zone of acceptability, the state may be held accountable to the client in a variety of actions. These include actions for right-to-treatment (*Halderman v. Pennhurst, 1977*; PCMH, 1978; *Wyatt v. Stickney, 1972*; and *Youngberg v. Romeo, 1982*); for a right to refuse treatment (PCMH, 1978; *Rennie v. Klein, 1978; Rogers v. Okin, 1979*); for a violation of civil rights (*Maher v. Gagne, 1980; Maine v. Thiboutot, 1980; Wood v. Strickland, 1975*); and for tort liability (Friedman, 1975).

In another sense, however, legal restraints make it clear that citizens control their governments by being able to regulate the mental health/retardation system. This is familiar ground; the San Francisco referendum on the use of electroconvulsive shock therapy posed the classic question: who "owns" whom, who controls whom? Does the mental health/retardation system have the right to control its own procedures, subject to time-honored legal doctrines, or does the citizenry have the right to impose, through law, limits on the profession and its operation under governmental auspices? To the degree that law limits aversive therapy, the answer is that the citizenry holds in check a profession and its practitioners, particularly those employed by the state. The result also may limit the autonomy of clients of the profession because they may be obliged to forego treatment that facilitates their autonomy.

The literature, as well as many of the concepts discussed in this section, have focused primarily on mentally competent people who may also be mentally ill or offenders (Friedman, 1975; PCMH, 1978; Schwitzgebel, 1972; Shapiro, 1974; Zlotnick, 1984). Indeed, an exhaustive review of the legal and law review commentary concerning behavior modification, covering the period 1974 through 1984, each inclusive, indicates that there are no articles dealing exclusively with law, therapy, and people who are mentally retarded. By contrast, the commentary focuses on juveniles and adults who have been involuntarily committed under state mental health laws, imprisoned upon conviction of a crime, or voluntarily sought admission to state psychiatric institutions. In only a few instances (Friedman, 1975; Shapiro, 1974) do the authors deal with people who are mentally retarded, and then only as tangential or subsidiary to their discussions of the rights of people who are mentally ill. Likewise, a comprehensive review of the case law on behavior modification, covering the same period, reveals that only a few courts have addressed the rights of people who are mentally retarded (*Halderman v. Pennhurst, 1977; Wyatt v. Stickney, 1972*). Their main focus has been on people who are mentally ill.

Nonetheless, there are similar legal problems, and the legal concerns applicable to such people who are mentally ill or convicted, and the values that underlie those concerns, apply equally to persons with mental retardation who are self-injurious. This is so because there seems to be no way yet conceptually to distinguish mental illness from mental retardation in the matter of the legal regulation of behavioral interventions; people with both conditions, or their duly authorized guardians, are protected equally by the Constitution. It is also so because, based on the conditional allowance of these therapies in mental retardation facilities by courts (*Halderman v. Pennhurst, 1977; Wyatt v. Stickney, 1972*) and state legislatures, it appears that the same concerns do apply to people who are self-injurious and mentally retarded as to other people with disabilities. It seems notable that persons with mental retardation have not been as much the center of legal attention as persons who are mentally ill, notwithstanding that they experience deficits in mental competence, display behavioral aberrations dangerous to themselves and others, are institutionalized voluntarily and involuntarily, are imprisoned, are subjected to behavioral interventions, and are as vulnerable as adults and children who are mentally ill.

In summary, substantive due process objections may stand in the way of aversive therapies' use; procedural safeguards of course apply in any event (*Matthews v. Eldridge, 1976; Parham v. J.R., 1979;* and *Sec'y v. Institutionalized Juveniles, 1979*). The Eighth Amendment's ban on cruel and unusual punishment has been used to forbid the therapy (*Kaimowitz v. Department of Mental Health, 1973; Mackey v. Procunier, 1973*), but the recent decision of the United States Supreme Court (*Bell v. Wolfish, 1979*) makes it unlikely that the Eighth Amendment will be useful to regulate aversives. The doctrine of less drastic alternatives may be a barrier. A concern about excessive control (state-sponsored Utopianism) and about therapist-client power relationships may be at work. The decency standard also stands as a formidable interposition; shocking-to-the-conscience decisions, sometimes thinly distinguished (*O'Connor v. Donaldson, 1974; Youngberg v. Romeo, 1982*), have laid waste mental health "interventions" that were particularly offensive. And the equitable distribution of benefits and burdens of treatment or nontreatment (National Commission, 1975) may be seen as a major restraint. The legal picture, then, is complex, but generally legal restraints do not absolutely forbid the use of aversive therapies.

## V. Public and Professional Silence in the Disabilities Area

The relatively short-lived use of involuntary or compulsory aversive procedures among prison populations (Gaylin & Blatte, 1975; Nietzel, 1979; Singer, 1977) and to a lesser extent among psychiatric patients in mental hospitals contrasts with their use on persons who are disabled, on whom these procedures have been in continuous use over the past 20 years or more. Why is this so? Can it be because of the nature of the behavior? That is doubtful. Not all severe forms of self-injurious behavior among people who are disabled present aberrations more threatening to self or others than many types of criminal behavior. Indeed, in some cases, the targeted behavior of people who are disabled was severely self-injurious; in other cases, it was not (see Tables 1-16 in appendix). In some cases, the targeted behavior of incarcerated criminals was severely dangerous to others; in other cases it was not (Nietzel, 1979). The nature of the behavior alone does not seem to explain the use of the procedures and the public reaction. Yet, there has not occurred within the general public or, until fairly recently, among disability professionals, any major reaction to the use of aversive procedures with individuals disabled by mental retardation, especially severe and profound mental retardation. Indeed, legal regulation of aversive therapies among people who are disabled largely sought to prohibit the use of the therapies without legally sufficient consent. It did not absolutely forbid them. There probably are many reasons for this silence. The discussion that follows provides a brief overview of several possible explanations.

### Prison Population Was Vocal; People With Disabilities Were Not

With respect to the protests by people themselves, there are at least three distinctions between people in prison and people who are mentally retarded. First, prisoners historically have expressed themselves, often violently, about conditions and treatment procedures imposed upon them. Mental patients also have expressed concerns about their treatment regimes (cf. Gotkin, 1975, a former mental patient who provided a critique of behavior modification procedures in institutional settings). Indeed, the major legal commentary on behavioral interventions focuses on psychiatric patients and prisoners, not on people with mental retardation, whom many commentators seem to deal with ambivalently (Friedman, 1975; PCMH, 1977; Shapiro, 1974). Individuals who are mentally retarded, however, and especially persons with severe mental retardation, do not always have the communication skills to protest (or approve of) aversive procedures. Nor do they necessarily have representatives or spokespersons who know about and disapprove the use of such therapies. The observation is especially notable given the proportionately large number of studies using aversive procedures with individuals who are severely/profoundly retarded (see Table 8 in text) and which have been conducted in institutional settings (see Table 11 in text) that have been removed from stringent public (but not professional or accreditation) scrutiny.

Second, the issue of informed consent also must be considered. As noted earlier, this is an important aspect of the legal controversy surrounding the use of aversive procedures with prisoners, who, unlike many people with mental disabilities, could effectively object. By contrast, people who are disabled could not, whether by reason of innate disability, institutional placement, or removal from advocacy sources.

Third, problems associated with consent for aversive treatment among many persons with mental retardation are similar to those described by Capron (1982) for biomedical interventions with children who are considered incompetent. At issue is the fact that persons with mental retardation (like children) are vulnerable to a myriad of educational and treatment decisions made by others. These people, including professionals, have immense authority over what is done to children or people with disabilities and an imbalanced power relationship that can, but does not always, put into doubt the elements of information and voluntariness in consent.

### Professional Silence Over the Years

Not only were people with disabilities silent, so too were many of their official spokespersons. Professional and parent organizations have not taken a particularly hard-line position on the use of aversive procedures. The first official organizational statement was issued by the American Association on Mental Deficiency (1972-75). AAMD's position is set out below:

Certain techniques for influencing behaviors may involve elements of risk, pain or infringements. In such instances more stringent review procedures should be imposed including (a) obtaining the informed consent of the individual; (b) evidence of participation of the recipient in the selection of techniques; (c) specific time periods for review of the effectiveness of such techniques as well as a system for minimizing risks; and (d) a procedure to appeal the decision of a review body. When considering the endorsement of these techniques in a program, a review body should weigh the likelihood of a long-term consequence which might be an undesired by-product of exposure to risk, pain or infringement on dignity.

Life-protecting techniques which interfere with physical self-destruction by the temporary use of restraining methods should be readily available but ought to be time-limited options within a behavior-building program. Each occasion of use should be reported to the review bodies, and frequent use should result in re-examination of the client's entire program.

More than a decade later, the Association for Retarded Citizens-US (1984) adopted a position that, like AAMD's, gives conditional approval to the use of aversives. Its position is set out below.

The ARC supports behavior management programs for persons who are mentally retarded that are:

applied in a humane and caring manner with the ultimate goal of growth and habilitation,

intended to enhance opportunities for self-determination and independence,

based upon the thorough assessment of each individual's existing competencies and characteristics,

effective in developing competence to cope with the environment and fostering more complex adaptive behaviors,

implemented by a staff that is well-trained in the specific approach being used,

monitored continuously and systematically to ensure that the approach is consistent with individual needs and successful in achieving established goals,

based on a positive approach to the development and maintenance of desirable behavior, and

free from methods and techniques which can produce physical or psychological pain or discomfort. Aversive or punitive approaches may be considered only in those cases where (1) all alternative positive approaches have been properly attempted and documented as unsuccessful, and (2) it has been determined that the person's current unsuitable behavior constitutes imminent and serious danger to himself or herself, or to other individuals. Positive approaches to behavior management must continue to be used in conjunction with such techniques. Additionally, an oversight committee must be convened within a school or agency to evaluate the initial need for and continued appropriateness of aversive approaches.

By contrast, the Executive Committee of The Association for Persons with Severe Handicaps (1981) passed a resolution that calls for the cessation of aversive procedures. Its resolution is set out below:

WHEREAS, In order to realize the goals and objectives of The Association for Persons with Severe Handicaps, including the right of each person experiencing a handicap to grow, develop, and enjoy life in integrated and normalized community environments, the following resolution is adopted:

WHEREAS, Educational and other habilitative services must employ instructional and management strategies which are consistent with the right of each individual with severe handicaps to an effective treatment which does not compromise the equally important right to freedom from harm. This requires educational and habilitative procedures free from indiscriminant use of drugs, aversive stimuli, environmental deprivation, or exclusion from services; and

> WHEREAS, TASH supports a cessation of the use of any treatment option which exhibits some or all of the following characteristics: (1) obvious signs of physical pain experienced by the individual; (2) potential or actual physical side effects, including tissue damage, physical illness, severe stress, and/or death, that would properly require the involvement of medical personnel; (3) de-humanization of the individual experiencing a severe handicap because the procedures are normally unacceptable for persons who are not in community environments; (4) extreme ambivalence and discomfort by family, staff, and/or caregivers regarding the necessity of such extreme strategies or their own involvement in such intervention; and (5) obvious repulsion and/or stress felt by peers who are not handicapped and community members who cannot reconcile extreme procedures with acceptable standard practice; and
>
> RESOLVED, That The Association for Persons with Severe Handicaps' resources and expertise be dedicated to the development, implementation, evaluation, dissemination, and advocacy of educational and management practices which are appropriate for use in integrated environments and which are consistent with the commitment to a high quality of life for individuals with severe handicaps.

## Societal Perceptions of Persons with Disabilities

Much has already been written about societal perceptions of persons with disabilities, especially individuals with severe and profound mental retardation. The general public often perceives such individuals as less than human, as "nonpersons" or even "vegetables."

The propensity to use more aversive procedures with persons who have more severe disabilities is reported by Kazdin (1980). In his study, college students were found to be more likely to view as acceptable a larger array of more drastic intervention strategies for behavior problems if the recipients were described as having behaviors commonly associated with mental retardation.

Even among some professionals the use of aversive procedures with people who are disabled is, in part, a reflection of a professional perception that people with disabilities have not achieved sufficiently equal status to people who are not disabled, and that treatment programs, no matter how drastic, may be justified as attempts to make them more "normal" or equal. An early statement by Watson (1967) reflects this perception.

> If such aversive consequences would contribute to delivering the severely or profoundly retarded child from his present *subhuman* state and help to make his behavior more 'normal,' this is a direct contribution toward his becoming a 'more complete and happier person.' (p. 15)

Although there is no evidence that definitively makes the causal connection, it may be that a reason for the excess of enthusiasm for aversives, relative to other procedures and their efficacy, is the view of some professionals, who both inherit and also are shaped by societal perceptions of people with disabilities, that such people are in some very real ways so distinguishable from nondisabled people as to be different and therefore able to be treated differently and less favorably. After all, animal research undergirds behaviorism and its application to humans. And it is beyond cavil that some of the early "eugenic" professional concerns about people with mental retardation—concerns that shaped policies as recently as the late 1960's and are the focus of the rights movement today—took the form of devaluing policies: segregation in institutions, exclusion from communities, compulsory sterilization, withholding of treatment from people with treatable medical conditions, and segregation in and exclusion from education (Barr, 1913; Tyor & Bell, 1984; Deutsch, 1949; Goddard, 1912; Herr, 1983; Kanner, 1964; Rosen, Clark, & Kivitz, 1976; Scheerenberger, 1983; Sloan & Stevens, 1976; Terman, 1916; Wolfensberger, 1975). The fact that laws reflecting these policies remain on the statute books of many states, albeit fewer than a decade ago and not always contemporaneously enforced, is further evidence of the not-so-recent and recent devaluation that accompanies a disability (Association for Retarded Citizens, 1984; Blatt, 1973; Blatt & Kaplan, 1966; Blatt, McNally, & Ozolins, 1979; Ellis & Luckasson, 1984; Gliedman & Roth, 1980; Herr, 1983; Morse, 1981; Sales, Powell, Van Duizend, & Associates, 1982; Sarason & Doris, 1979). Indeed, the plethora of new legal rights, including those to education, habilitation, nondiscrimination, limited guardianship, and medical treatment (Turnbull, 1979), and the establishment of

so many of them by judicial decree, when state legislatures and local governing bodies were unwilling to accord to people who are mentally retarded the same basic rights as those who are not, give further evidence of the dual standards in law and society that allowed and even encouraged so much devaluation and accompanying therapy (Turnbull, H.R., Brotherson, M.J., Czyewski, M.J., DePazza-Conway, M., Esquith, D., Otis, A., Summers, J.A., & Van Reusen, A., 1983).

### Popular Technology: Research and Training Programs

From the beginning, the use of aversive procedures with persons with disabilities has been and still is an integral component of the popular and widely used behavioral technology. The published research articles reviewed earlier not only reflected that fact but also legitimized professionals' use of aversive procedures.

An even greater impact, however, on the day-to-day use of aversive procedures in a multitude of applied settings resulted from university-based educational programs (especially special education and behavioral psychology). These programs included aversive procedures as part of the overall instructional technology. In many cases, the experimental analyses of aversive procedures were conducted by those same persons who were training personnel to educate and treat persons with disabilities. Additionally, the use of aversive procedures was advanced, in part, by persons who advocated for the procedures at conferences and workshops and who provided to students the leading textbooks and training manuals in the field. Cautions in the use of aversive procedures almost universally accompanied the teaching of these techniques, and practitioners were strongly encouraged to follow a hierarchy of least-to-most drastic interventions when working with aberrant behavior. It has been only recently, however, that a comprehensive textbook has been devoted exclusively to nonpunitive procedures for working with behavior problems among persons with severe disabilities (Evans & Meyer, 1985), and there is a scant amount of research being done to explore nonbehavioral approaches to treatment of behavior problems.

It may well be that the long-term use of aversive procedures with persons who have disabilities has resulted from an ideology grounded on behavioral principles, supported in part by empiricism, and conducted in the absence of competing, alternative procedures. The absence of other viable approaches to the treatment of aberrant behavior arguably reflects the popularity of behaviorism in the disabilities area and among the large number of professionals who have sustained it as an ideology. As noted by Wolfensberger (1980):

> Ultimately, the most important issues in human services (as in life, politics, economics, religion, etc.) have not been, are not, and never will be decided on the basis of 'research,' or even on the basis of empiricism and evidence. They will be settled on the plane of values and ideologies, or even of passion. In fact, ideology controls what kind of research does or does not get conducted, or what research is even possible to conduct, allowed, or funded. (p. 125)

The absence of professional associations' disapproval, either categorical or conditional, of the use of aversive therapies also is evidence of the professional mind set that encouraged those therapies; so too is the widespread literature in the research journals. Indeed, it was not until 1981 that TASH adopted its categorical condemnatory resolution; the American Association on Mental Deficiency (1972-75) earlier disapproved of the use of aversives, but only in a conditional way. The Association for Retarded Citizens (1984) also stated only conditional disapproval of such therapies. A similar stance was taken by the American Psychological Association (1978), as well as by the Association for the Advancement of Behavior Therapy (1982). Similarly, the Council for Exceptional Children (1983) recently adopted a Code of Ethics and related Standards for Professional Practice. The Code commits special educators to develop the highest educational and quality of life potential of exceptional children, to engage in only those professional activities that benefit children, and to not participate in unethical or illegal acts. The standards relating to behavior management call for special educators to apply only those disciplinary methods and behavioral procedures that "do not undermine the dignity of the individual or the basic human rights of exceptional persons (such as corporal punishment)," to conform to legal requirements relating to the "judicious application of disciplinary methods and behavioral procedures," and to "refrain from aversive techniques unless repeated trials of other methods have failed and then only after consultation with parents and appropriate agency officials."

# VI. Depersonalization

As indicated by the preceding sections, persons with disabling conditions, especially those with severe/profound mental retardation, comprise the minority group in America that has experienced the most systematic and long-term application of aversive procedures to modify behavior perceived as deviant. In many respects the field of developmental disabilities has witnessed (and continues to do so) an experiment of enormous magnitude, given the relatively small incidence level of the people on whom these procedures have been applied and the relatively inadequate research methodology of the experiments and studies.

It is easy for many to defend the use of aversives because of the behavioral characteristics of the people who have received these procedures. Indeed, the argument is compelling that such interventions are necessary, especially among persons with severe self-injurious behavior, to free them from their disabling behavior and thereby increase their opportunities for a better quality of life. In effect, the means justifies the ends, an argument that is a strong one for many persons for whom aversive procedures have been applied.

Another argument, however, objects to aversives and considers the long-term effects that might accrue when people have experienced a long history of behavioral control through the application of procedures that are intended to produce, at least temporarily, discomfort, if not pain, and that differ significantly in type, intensity, and location from what is used with nondisabled persons. A fundamental concern of the objecting argument is that the technology used to treat the perceived deviancy produces (or reflects) attitudes and perceptions towards those people that are inconsistent with attempts to achieve for them a more positive acceptance by society. In essence, the procedures used to educate or treat a specific group of people might, in the end, result in perceptions of them that are ultimately undesirable and produce intervention practices that are themselves antithetical to their dignity, contrary to the expressed desires of those who use aversives. Germane to this position is the issue of depersonalization, reflecting both how a particular technology influences what is done to people and ultimately how they are perceived by those individuals who apply the procedures.

As indicated below, depersonalization involves the separation in the therapist's view of the person from the technology used to treat an aspect of that person. Procedure can take precedence over the person. Depersonalization can take a number of forms, including descriptions of the procedures and equipment used in interventions, the reactions of people to the procedures, and the people themselves.

### Description of Treatment Procedures

In science a certain level of detachment is, of course, necessary for objective analyses of results. From both a scientific and applied perspective, the application of aversive procedures to modify behavior requires an objective description of the treatment process. The danger arises, however, when objectivity itself begins to override concerns for the individual whose behavior is being modified and when descriptions of the intervention processes are cloaked in scientific jargon.

Writing in response to the use of behavior modification procedures in psychiatric institutions and prisons, Opton (1975) observed:

> Recent years have witnessed increasing use of the medical metaphor. The language of behavior modification is ideally suited to this defensive operation, for it is abstract enough to include, yet disguise, any exertion of institutional power through reward and punishment. . .The language is useful for distracting the public, the legislature, the judiciary, and perhaps, occasionally, the inmates. But most of all, the language of behavior modification is marvelously suited to soothe the consciences of institutional administrators. (p. 24)

The use of language to describe aversive procedures in a more acceptable manner can be found in published literature related to people with disabling conditions. Mithaug and Hanawalt (1977) reported the use of a negative reinforcement procedure for increasing task compliance with a 19-year-old female described as severely retarded. The aversive stimuli was operationally defined as "finger and thumb pressure applied to back of neck/bicep of upper arm." In more common language, the procedure involved "pinching" the woman until she responded to task.

Singh *et al.* (1982) used an overcorrection and punishment procedure described as "oral hygiene punishment." In this study two 19-year-old twins

with profound mental retardation had their teeth brushed and lips and face wiped with Listerine contingent on rumination. Although the procedure was comparatively benign, the use of the term "oral hygiene" is, at best, misleading and incongruent with the purpose of the intervention procedure.

### Description of Reactions of Subjects

Another example of depersonalization involves descriptions of subject reactions to aversive procedures. In these instances, emotional expressions by the subject are presented in a matter-of-fact manner, implying a certain level of detachment of the procedure, and its outcome, from the total person.

The following examples from published studies describe people's reactions to aversive procedures.

Kircher *et al.* (1971) reported a study in which two children (ages 5 and 6) with severe mental retardation were shocked for incorrect responses to a picture-naming task.

> Derrick, on occasion, would hit the table following a shock and Bobby winced. However, slapping the subject's hand resulted in much more violent reactions. Following a slap they would sometimes scream and cry, although this behavior usually stopped abruptly when it was ignored. (p. 231)

Tanner and Zeiler (1975) used an ammonia capsule placed under the nose to reduce face slapping in a 20-year-old woman with autism.

> The subject reacted violently to the ammonia, turning her head and struggling with the experimenter, although the capsule could be brought to within a few inches of her nose immediately following a slap or antecedent behavior, largely because the subject did not leave her chair. (p. 57)

A more recent study by Friman *et al.* (1984) describes the reactions of an 11-year-old child with severe retardation to a punishment procedure being used to reduce his self-stimulatory behavior.

> The subject showed an intense reaction when both the lemon juice and the vinegar were delivered and his reactions were as much a deterrent to on-task behavior during training sessions as his self-stimulation. His reactions consisted of trunk-twisting, arm flapping, and leg extension as well as grimacing, spitting, coughing, screaming, and crying. (p. 44)

In each of the above examples is observed a detached (and depersonalized) description of emotional reactions by the people to the aversive procedures being applied to them. In retrospect, this type of detachment possibly is derived from a traditional definition of punishment as described by Azrin and Holz (1966).

> . . . *punishment is a reduction of the future probability of a specific response as a result of the immediate delivery of a stimulus for that response.* . . . the definition is not in terms of a subjective feeling or a state of being. Therefore, it will be incorrect to designate a stimulus as a punishing stimulus simply because that stimulus leads to a statement of unhappiness or to an emotional state. (p. 381)

In the attempt to provide a scientific approach to human problems, there exists the danger that more emphasis is placed on the procedure than the person. This shift is especially possible given the mechanistic and reductionistic orientation of behaviorism—a model that depicts the human organism as a set of component parts and whose emotional responses, attitudes, moral precepts, etc. are determined by the environment (cf. Schiamberg, 1985). Heschel (1965) warns that reductionism and its mechanistic principles prevent therapists from recognizing characteristics that set humans above the more mechanical aspects of their being and that ignore those behaviors that separate humans from the lower animals.

Burt (1977) has noted the effects on scientific medicine when depersonalization occurs. While applauding the advances in medical science, he also observed, "It is, however, a commonplace criticism of scientific medicine that its practitioners, because of their objectifying mind-set, rivet attention on the disease and lose sight of the patient" (p. 31). Burt further points to the need to maintain a transaction between doctor and patient and to do otherwise is ". . . the psychological precondition for infliction of extraordinary brutality" (p. 31).

The extensive and long-term use of aversive procedures with people who are disabled presents another problem that, itself, is also a possible outcome of depersonalization. This involves the

spread effect to other persons and behaviors and to the individuals, themselves, who consistently apply aversive procedures.

### The Spread Effect

In discussing the application of aversive procedures to prison inmates, Nietzel (1979) made the following observation: "the question of how to limit the escalation of punishment is a critical one for those professionals who would advocate even its very circumscribed use" (p. 246). Other behaviorists have expressed a similar concern about the spread effect of using aversive procedures with persons who are mentally retarded.

> Because punishment does produce at least immediate suppression of unwanted behavior, users of punishment may be negatively reinforced to use punishment until it becomes their major strategy to change behavior. This explains why attendants, teachers, aides, and others who work with children with retarded behaviors often employ aversive tactics: punishment has its 'rewards'—the immediate suppression of the unwanted behavior, the immediate compliance of the punished person. Even if the worker is opposed to punishment and tries not to use it, he may find himself using it more frequently if it works; because it is immediately effective, it tends to become habit forming. (Neisworth & Smith, 1973, p. 54)

Lovaas (1982) notes that therapists' use of aversives may be grounded on considerations other than "hard data." He says they may select aversives because of their own "anxiety" and thereby become aggressive themselves. It was, indeed, the concern for the overuse and possible abuse of aversive procedures that prompted the Executive Board of The Association for Persons with Severe Handicaps (1981) to issue its resolution calling for the cessation of intrusive interventions.

This resolution was based on perceptions of the Executive Board members that aversive procedures were being applied indiscriminately in education and treatment for students with severe disabling conditions. The effect of the resolution on practitioners throughout the country is largely unknown. The resolution does, however, reflect a genuine concern that the application of aversive procedures to people with disabling conditions has moved beyond the original intentions of even the most ardent behaviorists.

One might have predicted this undesirable spread effect, given the extensive inclusion of aversive procedures as part of the armament for treating persons with mental retardation (as discussed earlier). Additionally, there are sufficient examples in the published literature to indicate that researchers, themselves, have extended the application of aversive procedures to highly questionable areas of response modification. This includes the possible misapplication of aversive procedures to decrease behavior in other populations, to decrease behavior that might best be intervened on with less intrusive methods, and to actually teach new skills.

An example of how the use of aversive procedures was applied in a questionably appropriate manner to another population is found in a study reported by Tough *et al.* (1971). In this study a delayed punishment procedure consisting of a cold bath was applied to an 8-year-old child described as multiply disabled (cerebral palsied, legally blind) for nocturnal enuresis. The procedures, which were successful, were then applied to his 4-year-old *nondisabled* sibling who was also enuretic, with less positive results. The spread effect also is evident in the widespread use of aversives not just in institutions, but also in school settings, as shown in Part III of this paper.

On a much larger scale, a question needs to be raised concerning the types of behavior that warrant the use of aversive procedures by both researchers and practitioners. The demographic data reported earlier in Table 9, for example, show that of the published articles reviewed, 26% of the punishment studies and 45% of the overcorrection studies were directed towards the deceleration of stereotyped/self-stimulatory behavior. Punishment studies have included, for example, electric shock for rocking behavior (Baumeister & Forehand, 1972), hand slapping for hands in mouth and finger movements (Romanczyk, 1977), and a comparison of water mist to the face, and vinegar or lemon juice into the mouth, to decrease hand clapping and hand and finger jabbing (Friman *et al.*, 1984).

The possibility must at least exist that, with some research efforts, the use of aversive procedures to decrease self-stimulatory behavior was motivated primarily by the desire to demonstrate the efficacy (and power) of the procedures; that the presumed advancement of behavioral technology took precedence over both the dignity and psychological well being of the recipients of the procedures.

This possibility is strengthened by the facts that: 1) stereotyped/self-stimulatory behavior are easily quantifiable, occur at high rates, and are thus ideal target behaviors for scientific investigation; and 2) they occur at high rates among

individuals with severe and profound retardation who have little recourse to things done to them, no matter how well intended.

The spread effect can be observed also in the use of aversive procedures to teach new skills, as indicated in Parts II and III. The following examples that demonstrate this point can be found in both the older and newer published literature.

Massey and Insalaco (1969) employed white noise at 95 db as an aversive punisher for incorrect responses to a visual discrimination task among 40 children, ages 7-21, who were described as severely/profoundly retarded. Kircher *et al.* (1971) used a shock punisher for inattention in a picture-naming task with two young children diagnosed as severely/profoundly retarded. The subjects were also slapped on the hand for grabbing tokens, or when they attempted to leave the experimental room. Hinerman *et al.* (1982) used an overcorrection procedure (forced hand movements) for incorrect responses with a child with autism who was being taught to sign words.

The above examples demonstrate a spread effect that is more aptly described as "procedural decay," i.e., using aversive procedures to teach skills. A potentially alarming aspect of this phenomenon is the extent to which practitioners (including teachers) have followed a similar path, using teaching and treatment routines that encompass aversive procedures that have been disseminated and, indeed, legitimized by published research articles in professional journals and by textbooks.

Numerous anecdotal reports to the authors concerning inappropriate application of aversive procedures in classrooms for students with severe handicaps include the following two: placing a washcloth with ice on it below the face of a preschool child to increase head-erect behavior (described as a negative reinforcement procedure); and the heavy and indiscriminate use of water spray to the faces of an entire classroom of students who were observed to exhibit relatively minor infractions. In neither case were systematic efforts made to evaluate the effects of the procedures—they were, in fact, considered routine classroom operations.

The extent to which aversive procedures have become standard interventions in educational settings for students with disabling conditions is largely unknown. Many school settings operate without even the pretense of a human rights committee. More important, however, is the possibility that a long history of using aversive procedures with persons who are disabled has desensitized teachers and practitioners to the potential abuses and misuses of these procedures. Indeed, in the field of special education, Wood (1978) has filed the following caveat:

> Using punishment should be a painful experience for the punisher as well as the punished. When our rationalizations come too easily and we cease to be sensitive about the infliction of pain on others, or even worse, begin to find satisfaction in punishing, we have lost some of our own humanity. (p. 122)

# VII. Summary and Recommendations

The use of aversive procedures to modify the behavior of persons with disabling conditions has a long history, one that parallels in many respects the growth of applied behavior analysis as a therapeutic and educational approach to human needs. The outcome of this effort, as reported in published studies, is equivocal. Initial suppression of behavior is commonly reported in the literature, but reported effects of generalization and long-term maintenance are inconclusive.

Demographic data of published studies indicate that persons with severe and profound disabilities are the most frequent recipients of aversive procedures among the population of individuals who are disabled, especially when they reside in institutional settings. The relatively high occurrences of perceived deviant behavior among persons with severe/profound disabilities, especially those behaviors identified as self-injurious, seem to account for the extensive use of aversive procedures with this population. This outcome is certainly not surprising, as it reflects the behavioral characteristics of persons with severe/profound disabilities, their needs and rights to treatment, and the wide-spread dissemination of a technology designed to treat severe problems of this nature.

The issues raised in this paper do not address solely the scientific legitimacy of using aversive procedures with individuals who demonstrate behavioral excesses and deficiencies that differ significantly from those of nondisabled people. If one assumed that the procedures were unequivocally effective in suppressing behavior, the present justification for their application might still exist, given societal and professional views of such people, although we ourselves argue elsewhere against this result (Turnbull *et al.*, 1986). Indeed, the use of aversive procedures with persons who are disabled has important implications for how we not only perceive such people but also ultimately relate to them as members of a minority population and as fellow human beings. The use of aversive procedures demands thoughtful discussion of whether technology is ultimately worse or at least no better than the behavior of those subjected to it.

Further, the use of aversive procedures goes beyond the establishment of a science or technology; it involves values, attitudes, and standards for human dignity. Inevitably, consideration must be given to the ethical and moral implications of what has been done and to the posture that allows science alone to pass judgement on the validity of using procedures on other human beings that are designed to inflict pain and discomfort. This is so because, in the final determination, the use and interpretation of empirical data and the theoretical concepts of any explanation of behavior and its modification are subject to the biases, value systems, and errors not just of those people who embrace and use them but also of those who comprise the society of which the users, and their subjects, are parts. This is as things are; it also is as things should be. Science is but a means, as are all bodies of knowledge, service systems, and law. The end is the enhancement of the individual.

The debate over any use of aversive procedures undoubtedly will continue. Indeed, well respected advocates of these procedures will provide rational arguments that support the efficacy and justify use of these intervention practices. They will point to extreme cases where aversive procedures provide a "last resort" attempt to improve the quality of life condition of a person with a severe disability. Their arguments from both a humane and scientific perspective will be most compelling. With the expectation of this appeal, it is even more necessary that a concerted effort be made to explore further the issues involved and to chart new directions so that well meaning persons on both sides of the controversy can arrive at a better understanding of what is meant by deviant behavior and how it should be treated. The following recommendations are intended as first steps in that charting.

1. *Better identification of the extent to which aversive procedures are being used in education and treatment settings.*

A significant portion of this monograph reports on studies that used aversive procedures as they have been published in the professional literature. More information and data are needed on the extent to which the use of aversive procedures has become or is close to becoming routine treatment in classroom and treatment settings throughout the country and, importantly, what types of behaviors have been targeted for treatment. The question is whether aversive procedures

are used infrequently (and for only the most severe behavior problems), or whether these procedures are used more widely, and for other than severe behavior problems. Are there, for example, a significant number of teachers who routinely use water sprays to the face for relatively minor classroom infractions? What types of aversive procedures are being used in institutional settings, and for what purposes?

Undoubtedly, it will be most difficult to collect these data. An in-depth study of randomly selected education and treatment sites would provide at least some indication of the extent of continued use, and type of use, of these interventions.

2. *Expanded discourse on the ethical/moral issues involved in using aversive procedures with persons who are disabled.*

It is hoped that this monograph will serve to inform the dialogue and debate on ethical and moral considerations that pertain to the use of aversive procedures. Indeed, this type of discourse needs to involve the scientific community, ethicists, advocates for persons with disabilities, members of the general population, and recipients of the treatment and their representatives. The issues involved go far beyond demonstrations of efficacy. They relate also to questions of right and wrong, professional conduct and responsibility, and the general attitudes towards, and perceptions of, persons who are disabled.

Turnbull *et al.* (1986) recently offered a model for analyzing the moral aspects of using aversive procedures with persons who are disabled. As part of this analysis, they applied traditional moral and ethical principles to the decision making process. Their model and conclusions provide a useful starting point for a dialogue on the ethical and moral dimensions of using aversive procedures to intervene with persons who are disabled. It is recommended that our own field extend this direction by providing more opportunities at conferences, and in our professional journals, to question and discuss practices that, like aversive procedures, involve the potential for abusing those persons whom we are responsible for serving. Importantly, these issues and controversies should be included in special education and related training programs that prepare personnel to educate and treat persons with disabilities.

3. *Research into alternatives to aversive procedures.*

This final recommendation is offered in the absence of extensive research into alternative and nonpunitive methods for intervening with severe types of behavior problems. More research studies are needed into the etiology of deviant behaviors, the issues of multiple causality (including biochemical factors), and a host of procedures that might effectively and nonintrusively modify those severe and sometimes life-threatening behaviors common to persons with disabilities.

Those persons who adhere to a behavioral approach should concentrate, as many are now doing, on research studies demonstrating nonpunitive intervention procedures. Additionally, treatment procedures from other theoretical approaches need to be identified and researched.

It is recommended that TASH take a leading role in advocating for funds that support further research in the development and analysis of nonaversive intervention procedures. Data presented in this monograph indicate clearly that persons with severe and profound disabilities are heavily targeted for various aversive procedures. Accordingly, members of the Association have the responsibility to provide meaningful and positive alternative procedures to support the earlier resolution of 1981 that called for the termination of intrusive interventions.

# Epilogue

The October 1981 TASH Resolution on Intrusive Interventions calling for the cessation of aversive procedures is grounded in the Association's often articulated first principle that persons with severe handicaps have a right to education, training and treatment that is *both* humane and effective. Those who are troubled by the absolute prohibition of aversive procedures and those who advocate for the use of aversives rely almost exclusively on a means-ends rationale. They argue that means such as electric shock, corporal punishment and the rest, while patently not acceptable in the normal course, are justified professionally and ethically in extraordinary situations to control seriously destructive behavior where less intrusive and non-aversive means are not available. The professionally desired end-elimination of the targeted behavior (in the most compelling case, life threatening self injurious behavior) justifies the most extreme aversive means. The proponents of aversive procedures, for the most part, would say no other relevant ethical or professional questions remain if the treatment is effective and used as a last resort.

The means-ends approach to the use of aversives is much too narrowly focused. Couched in the medical metaphor and posing the issue falsely as whether to cure or not cure, the means-ends argument cuts into the debate at the penultimate point by passing the complex threshold questions. It neatly avoids a series of issues surfaced and analyzed in the monograph:

> How a class of persons—the most severely intellectually handicapped—came to be targeted for aversive routines;
>
> How aversives came to be used almost exclusively in segregated, isolated institutional environments;
>
> How historical, popular prejudices and professional prejudgements affect decision making on aversives;
>
> How the medico-scientific vocabulary of the debate obscures the otherwise obvious ethical, moral and professional imperatives;
>
> How the depersonalization of both the person who is hitting, slapping, shocking, spraying and pinching as well as the person who is being hit, slapped, shocked, sprayed or pinched, acts to obliterate limits and moves the aversive from the realm of exceptional use to the arena of the routine.

A major contribution of this monograph is to frame the issue of aversives as one that extends beyond a means-ends test. The small number of studies published over the last two decades, many inadequately designed, demonstrate that the aversives used are effective if at all mainly for the short term. Long term effects, generalization, and absence of negative side effects cannot be confidently asserted and certainly not assumed. This lack of data on long term effects and failure to investigate generalization reduces the research to a set of unremarkable findings that aversives in various combinations do temporarily control behavior. The past research and more of its kind can be used to support use of the most extraordinary and intrusive procedures if the end sought is short term transitory behavioral change. However, if the goal of training and treatment procedures is to enable persons with severe handicaps to experience and enjoy life in integrated and normalized community environments, research of the ilk arrayed in the monograph is of marginal relevance.

The published research, as the authors of the monograph point out is clearly not representative of the effectiveness of aversives or even an accurate accounting of the range and intensity of the aversives in use. For example, in one residential treatment program (Behavior Research Institute) used by some states to meet their obligations under P.L. 94-142, some sixty students with severe handicapping conditions and extensive behavioral needs were routinely and repetitively subjected to a range of extraordinary and aversive procedures including water spray, vapor spray, taste aversive, overcorrection, contingent physical exercise, helmet with built in vapor spray, automatic vapor spray station (AVS), ammonia, hand and wrist squeeze, spank, muscle squeeze, pinch, brief cool shower, rubber band, and social punishers. These interventions were used in combination by BRI to suppress twenty or more targeted behaviors ranging from seriously self injurious and aggressive behavior to

behaviors identified as mumbling, giggling or inattention to task. BRI claims its aversive procedures are both necessary and effective and those claims have been accepted in large part by the popular press (Newsweek, People) and the state courts. However, the director of BRI, a Harvard University trained clinical psychologist, has never subjected the program to the scrutiny of the professional journals reviewed in this monograph or submissions have not yet survived the process of professional peer review.

BRI is the most notorious but not the only example of aversive treatment not reported or reviewed in the professional journals. The records of the deinstitutionalization-institutional reform cases of the seventies are replete with accounts of extraordinary aversive behavior control—sometimes called abuse sometimes called treatment. In the recent past, an Illinois court approved the use of electric shock as appropriate behavioral treatment for a person with severe handicapping conditions. In Minnesota, use of an aversive procedure in a state institution, gave rise to detailed findings of noncompliance by a federal court monitor. In New York, a state investigation of an agency revealed that persons with developmental disabilities were restrained in chairs, forced to inhale ammonia and sprayed in the face with water for behavior which posed no danger to themselves or others.

These reports, together with the relative professional silence noted in the monograph, give rise to a sense of urgency for improved identification of use of aversives, expanded ethical discourse, and research on non-punitive alternatives to aversives. Concerted action by TASH and other professional organizations move us to a closer realization of the 1981 TASH resolution. However, as we work to fulfill the intent of TASH, we must acknowledge without the need for further investigation that the evil the resolution sought to eliminate is not diminished but more pervasive. Now, as in 1981, states and local school districts have yet to come to grip with the need to support individuals who demonstrate the challenging and destructive behaviors, in their communities, close to home and family. It is this failure that sustains and still nourishes long term aversive treatment regimes such as those found at BRI. It is this failure that leads parents, press, and public to believe that for some, even the most extreme and prolonged aversive regime is justified.

The monograph suggests the desirability of explicitly recognizing absence of scientifically demonstrated effectiveness as an independent basis for prohibiting the use of aversives. Procedures varying from physical injury and psychological stress to dehumanization entail a clear risk of harm. The 1981 resolution asks for procedures to be judged categorically, and absolutely prohibited for use in any circumstance regardless of the possibility for effectiveness. This statement invites the means-end effectiveness rebuttal and lends plausibility to a claim that the TASH resolution denies treatment that would result in the very goal TASH seeks—the full participation and integration of persons with severe handicaps into the life of the community. TASH has always been concerned and invested in humane and effective education and treatment, therefore—aversives prohibited by the 1981 resolution should be regularly examined in light of both criteria.

Any extraordinary procedure for which no precedent can be found in the professional scientific literature demonstrating effectiveness (including long term positive effects, generalization and absence of negative side effects) should clearly not be used on those professional grounds alone. A review of research shows the value of attending to all aspects of the effectiveness dimension but doing so within a larger framework. We must take into account and weigh heavily our historical and present experience that where technology and science point to extraordinary and extreme practices to be applied to persons who are severely handicapped, decisions about using those practices are as likely to be prejudgements rooted in societal attitudes toward persons with severe handicaps as they are likely to be based in scientific method.

While research about alternative positive, nonpunitive procedures is needed, it is important to underscore that the use of alternative positive procedures is a present imperative more than it is a future direction. The application of aversives in individual cases is almost always rationalized by the non-availability of non-punitive alternatives. The existence of alternatives is a function of the adequacy of the program and service delivery system. Any suggestion that a person be subjected to aversive procedures or removed to a segregated environment where aversives are condoned should immediately trigger an investigation. The need for effectiveness, and efficiency of the proposed procedure, the adequacy of an individual's overall program, and the quality of the service delivery system supporting the individual program must be investigated and reviewed. This review includes:

1. Analysis and treatment of medical conditions which may cause or exacerbate the problem behavior or be exacerbated by the proposed aversive.

2. Analysis of environmental conditions provoking problem behavior and the functions which the problem behavior serve.

3. Evidence of a systematic treatment plan to alter the conditions and contingencies which maintain the problem behavior and to teach functional alternative positive behaviors to replace them.

4. Documentation of full exploration of appropriate alternative and nonintrusive treatments.

5. A clear emphasis in the client's individualized habilitation and educational plan on the development of alternative positive skills, which will provide the individual with functional alternatives to the continued use of the problem behavior.

6. Selection of consequences for occurrences of the problem behavior which are justified empirically, represent a match between the severity of the problem and the degree of intrusiveness, and conform to accepted practices, in the professional literature.

7. Provision for generalizing improvement into all environments and situations which are individually relevant, including least restrictive adult living, vocational, leisure/recreational, and community settings over time.

Attention to these elements of an individual's program will expose the weaknesses in the overall plan. Weaknesses in program design or implementation may facilitate decisions for aversive treatments. Aversives are more likely to be suggested and used where professional staff are deficient and untrained in individual instructional strategies and are not skillful in identifying and evoking positive alternative procedures which are functionally incompatible with problem behaviors. Similarly aversives are more likely to be used and maintained where there is no or only token independent peer review or human rights review of individual treatment plans and inadequate or coerced parental involvement.

The achievement of the TASH Resolution on Intrusive Interventions will be informed by, but not rest on, questions of research or procedure. It will—as this monograph suggests—be achieved as we become clear as to the values governing the resolution, incorporate those values into our work and daily life, and steadfastly teach and apply those values in the most difficult cases and in the most trying circumstances.

## References


Adams, W. (1980). Treatment of assaultive hair pulling in a multihandicapped youth. *Journal of Autism and Developmental Disorders, 10,* 335-342.

Agosta, J.M., Close, D.W., Hops, H., & Rusch, F.R. (1980). Treatment of self-injurious behavior through overcorrection procedures. *Journal of the Association for the Severely Handicapped, 5,* 5-12.

Altman, K., Haavik, S., & Cook, J.W. (1978). Punishment of self-injurious behavior in natural settings using contingent aromatic ammonia. *Behavior Research & Therapy, 16,* 85-96.

Altman, K., & Krupsaw, R. (1982). Increasing eye contact by head-holding. *Analysis and Intervention in Developmental Disabilities, 2,* 319-327.

American Psychological Association Commission (1978). *Ethical issues in behavioral modification.* San Francisco: Jossey-Bass, Inc., Publishers.

Anderson, L., Dancis, J., & Alpert, M. (1978). Behavioral contingencies and self-mutilation in Lesch-Nyhan disease. *Journal of Consulting and Clinical Psychology, 46,* 529-536.

Association for the Advancement of Behavior Therapy (1982). The treatment of self-injurious behavior. *Behavior Therapy, 13,* 529-554.

Association for Retarded Citizens, Amicus Curiae Brief, *City of Cleburne, Texas, et al., v. Cleburne Living Center, Inc. et al.,* No. 84-468, United States Supreme Court (October Term, 1984).

Axelrod, S., & Apsche, J. (1983). *The effects of punishment of human behavior.* New York: Academic Press.

Azrin, N.H., & Armstrong, P.M. (1973). The "Mini-Meal"—a method for teaching eating skills to the profoundly retarded. *Mental Retardation, 11,* 9-13.

Azrin, N.H., & Foxx, R.M. (1971). A rapid method of toilet training the institutionalized retarded. *Journal of Applied Behavior Analysis, 4,* 89-99.

Azrin, N.H., Gottlieb, L., Hughart, L., Wesolowski, M.D., & Rahn, T. (1975). Eliminating self-injurious behavior by educative procedures. *Behavior Research and Therapy, 13,* 101-111.

Azrin, N.H., & Holz, W.C. (1966). Punishment. In W. Honig (Ed.), *Operant behavior: Areas of research and application* (pp. 380-447). New York: Appleton-Century-Crofts.

Azrin, N.H., Kaplan, S.J., & Foxx, R.M. (1973). Autism reversal: Eliminating stereotyped self-stimulation of retarded individuals. *American Journal of Mental Deficiency, 78,* 241-248.

Azrin, N.H., & Powers, M.A. (1975). Eliminating classroom disturbances of emotionally disturbed children by positive practice procedures. *Behavior Therapy, 6,* 525-534.

Azrin, N.H., Sneed, T.J., & Foxx, R.M. (1973). Dry bed: A rapid method of eliminating bedwetting (enuresis) of the retarded. *Behaviour Research and Therapy, 11,* 427-434.

Azrin, N.H., & Wesolowski, M.D. (1974). Theft reversal: An overcorrection prodecure for eliminating stealing by retarded persons. *Journal of Applied Behavior Analysis, 7,* 577-581.

Azrin, N.H., & Wesolowski, M.D. (1975). Eliminating habitual vomiting in a retarded adult by positive practice and self-correction. *Journal of Behavior Therapy and Experimental Psychiatry, 6,* 145-148. (a)

Azrin, N.H., & Wesolowski, M.D. (1975). The use of positive practice to eliminate persistent floor sprawling by profoundly retarded persons. *Behavior Therapy, 6,* 627-631. (b)

Baer, D.M. (1971). Let's take another look at punishment. *Psychology Today, 5,* 32, 34, 36, 37, 111.

Bailey, S.L. (1983). Extraneous aversives. In S. Axelrod & J. Apsche (Eds.), *The effects of punishment on human behavior.* New York: Academic Press.

Barnard, J.D., Christophersen, E.R., & Wolf, M.M. (1976). Parent-mediated treatment of children's self-injurious behavior using overcorrection. *Journal of Pediatric Psychology, 1,* 56-61.

Barr, A. (1913). *Mental defectives: Their history, treatment, and training.* Philadelphia: P. Blakeston's Son & Co.

Barrett, R.P., & Shapiro, E.S. (1980). Treatment of stereotyped hair-pulling with overcorrection: A case study with long term follow-up. *Journal of Behavior Therapy and Experimental Psychiatry, 11,* 317-320.

Barton, E.S., & Osborne, J.G. (1978). The development of classroom sharing by a teacher using positive practice. *Behavior Modification, 2,* 231-250.

Baumeister, A.A., & Baumeister, A. (1978). Suppression of repetitive self-injurious behavior by contingent inhalation of aromatic ammonia. *Journal of Autism and Childhood Schizophrenia, 8*(1), 71-77.

Baumeister, A.A., & Forehand R. (1972). Effects of contingent shock and verbal command on body rocking of retardates. *Journal of Clinical Psychology,* 28, 586-590.

Becker, J., Turner, S.M., & Sajwaj, T. (1978). Multiple behavioral effects of the use of lemon juice with a ruminating toddler-age child. *Behavior Modification, 2,* 267-279.

*Bell v. Wolfish,* 441 U.S. 520 (1979)

Birnbrauer, J. (1968). Generalization of punishment effects. A case study. *Journal of Applied Behavior Analysis, 1,* 201-211.

Blatt, B. (1973). *Souls in extremis.* Boston: Allyn and Bacon.

Blatt, B., & Kaplan, F. (1966). *Christmas in purgatory.* Boston: Allyn and Bacon.

Blatt, B., McNally, J., & Ozolins, A. (1979). *The family papers.* Boston: Longman Press.

Blount, R., Drabman, R., Wilson, N., & Stewart, D. (1982). Reducing severe diurnal bruxism in two profoundly retarded females. *Journal of Applied Behavior Analysis, 15,* 565-571.

Borreson, P. (1980). The elimination of a self-injurious avoidance response through a forced running consequence. *Mental Retardation, 18,* 73-77.

Burt, R.A. (1977). The limits of law in regulating health care decisions. *Hastings Center Report,* December, 29-32.

Butler, J.F. (1976). Toilet training in a child with spina bifida. *Journal of Behavior Therapy and Experimental Psychiatry, 7,* 63-65.

Capron, A.M. (1982). The authority of others to decide about biomedical interventions with incompetents. In W. Gaylin & R. Macklin (Eds.), *Who speaks for the child: The problems of proxy consent* (pp. 115-152). New York: Plenum Press.

Carey, R.G., & Bucher, B. (1981). Identifying the educative and suppressive effects of positive practice and restitutional overcorrection. *Journal of Applied Behavior Analysis, 14,* 71-80.

Carroll, S.W., Sloop, E.W., Mutter, S., & Prince, P.L. (1978). The elimination of chronic clothes ripping in retarded people through a combination of procedures. *Mental Retardation, 16,* 246-249.

Clements, J., & Dewey, M. (1979). The effects of overcorrection: A case study. *Behavior Research and Therapy, 17,* 515-518.

Cohen, R., Mayhew, G., & Clemens, D. (1980). Comparison of topographically similar and dissimilar positive practice and a DRO procedure in the management of a stereotypic behavior. *Journal of the Association for the Severely Handicapped, 5,* 294-302.

Coleman, R.S., Whitman, T.L., & Johnson, M.R. (1979). Suppression of self-stimulatory behavior of a profoundly retarded boy across staff and settings: An assessment of situational generalization. *Behavior Therapy, 10,* 266-280.

Conley, O.S., & Wolery, M.R. (1980). Treatment by overcorrection of self-injurious eye gouging in preschool blind children. *Journal of Behavioral Therapy and Experimental Psychiatry, 11,* 121-125.

Conway, J., & Bucher, B. (1974). "Soap in the mouth" as an aversive consequence. *Behavior Therapy, 5,* 154-156.

Cook, J.W., Altman, K., Shaw, J., & Blaylock, M. (1978). Use of contingent lemon juice to eliminate public masturbation by a severely retarded boy. *Behavior Research & Therapy, 16*(2), 131-134.

Corte, H., Wolf, M., & Locke, B. (1971). A comparison of procedures for eliminating self-injurious behavior of retarded adolescents. *Journal of Applied Behavior Analysis, 4,* 201-213.

Council for Exceptional Children (1983). Code of ethics and standards for professional practice. *Exceptional Children, 50*(3), 205-218.

deCatanzaro, D.A., & Baldwin, G. (1978). Effective treatment of self-injurious behavior through a forced arm exercise. *American Journal of Mental Deficiency, 82,* 433-439.

Denny, M. (1980). Reducing self-stimulatory behavior of mentally retarded persons by alternative positive practice. *American Journal of Mental Deficiency, 84,* 610-615.

Deutsch, A. (1949). *The mentally ill in America* (2nd ed.). New York: Columbia University Press.

Doleys, D.M., & Arnold, S. (1975). Treatment of childhood encopresis: Full cleanliness training. *Mental Retardation, 13,* 14-16.

Doleys, D.M., & Wells, K.C. (1978). Situation generality of overcorrective functional movement training. *Psychological Reports, 43,* 759-762.

Doleys, D.M., Wells, K.C., Hobbs, S.A., Roberts, M.W., & Cartelli, L.M. (1976). The effects of social punishment on noncompliance: A comparison with timeout and positive practice. *Journal of Applied Behavior Analysis, 9,* 471-482.

Dorsey, M., Iwata, B., Ong P., & McSween, T. (1980). Treatment of self-injurious behavior using a water mist: Initial response suppression and generalization. *Journal of Applied Behavior Analysis, 13,* 343-353.

Drabman, R.S., Cordua y Cruz, G., Ross, J., & Lynd, S. (1979). Suppression of chronic drooling in mentally retarded children and adolescents: Effectiveness of a behavior treatment package. *Behavior Therapy, 10,* 46-56.

Duker, P.C., & Seys, D.M. (1977). Elimination of vomiting in a retarded female using restitutional overcorrection. *Behavior Therapy, 8,* 255-257.

Durana, I.L., & Cuvo, A.J. (1980). A comparison of procedures for decreasing public disrobing of an institutionalized profoundly mentally retarded woman. *Mental Retardation, 18,* 185-188.

Ellis, J., & Luckasson, R., Amicus Curiae Brief for American Association on Mental Deficiency

et al., *City of Cleburne, Texas et al., v. Cleburne Living Center, Inc., et al.*, No. 84-468, United States Supreme Court (October Term, 1984).

Epstein, L.H., Doke, L.A., Sajwaj, T.E., Sorrell, S., & Rimmer, B. (1974). Generality and side effects of overcorrection. *Journal of Applied Behavior Analysis, 7,* 385-390.

Evans, I.M., & Meyer, L.H. (1985). *An educative approach to behavior problems: A practical decision model for interventions with severely handicapped learners.* Baltimore: Paul H. Brookes.

Favell, J., McGimsey, J., & Jones, M. (1978). The use of physical restraint in the treatment of self-injury and as positive reinforcement. *Journal of Applied Behavior Analysis, 11,* 225-241.

Fonagy, P., & Slade, P. (1982). Punishment vs. negative reinforcement in the aversive conditioning of auditory hallucinations. *Behavior Research and Therapy, 20,* 483-492.

Forehand, R., & Baumeister, A.A. (1976). Deceleration of aberrant behavior among retarded individuals. In M. Hersen, R.M. Eisler, & P.M. Miller (Eds.), *Progress in behavior modification* (Vol. 2). New York: Academic Press.

Foxx, R.M. (1976). Increasing a mildly retarded woman's attendance at self-help classes by overcorrection and instruction. *Behavior Therapy, 7,* 390-396. (a)

Foxx, R.M. (1976). The use of overcorrection to eliminate the public disrobing (stripping) of retarded women. *Behavior Research and Therapy, 14,* 53-61. (b)

Foxx, R.M. (1977). Attention training: The use of overcorrection avoidance to increase the eye contact of autistic and retarded children. *Journal of Applied Behavior Analysis, 10,* 489-499.

Foxx, R.M., & Azrin, N.H. (1972). Restitution: A method of eliminating aggressive-disruptive behavior of retarded and brain damaged patients. *Behavior Research and Therapy, 10,* 15-27.

Foxx, R.M., & Azrin, N.H. (1973). The elimination of autistic self-stimulatory behavior by overcorrection. *Journal of Applied Behavior Analysis, 6,* 1-14.

Foxx, R.M., & Azrin, N.H. (1974). The elimination of autistic self-stimulatory behavior by overcorrection. *Annual Review of Behavior Therapy,* 528-547.

Foxx, R.M., & Bechtel, D.R. (1983). Overcorrection: A review and analysis. In S. Axelrod & J. Apsche (Eds.), *The effects of punishment on human behavior.* New York: Academic Press.

Foxx, R.M., & Martin, E.D. (1975). Treatment of scavenging behavior (coprophagy and pica) by overcorrection. *Behavior Research and Therapy, 13,* 153-162.

Foxx, R.M., Snyder, M.S., & Schroeder, F. (1979). A food satiation and oral hygiene punishment program to suppress chronic rumination by retarded persons. *Journal of Autism and Developmental Disorders, 9,* 399-412.

Franks, C.M. (1969). *Behavior therapy: Appraisal and status.* New York: McGraw-Hill Book Co.

Freeman, B.J., & Pribble, W. (1974). Elimination of inappropriate toileting behavior by overcorrection. *Psychological Reports, 35,* 802.

Friedman, P.R. (1975). Legal regulation of applied behavior analysis in mental institutions and prisons. *Arizona Law Review, 17,* 39-104.

Friman, P., Cook, J.W., & Finney, J. (1984). Effects of punishment procedures on the self-stimulatory behavior of an autistic child. *Analysis and Intervention in Developmental Disability, 4,* 39-46.

Gaylin, W., & Blatte, H. (1975). Behavior modification in prisons. *American Criminal Law Review, 13,* 11-35.

Gliedman, J., & Roth, W. (1980). *The unexpected minority: Handicapped children in America.* New York: Harcourt, Brace, Jovanovich.

Goddard, H. (1912). *The Kallikak family.* New York: Macmillan Company.

Gotkin, J. (1975). New words for an old power trip: A critique of behavior modification in institutional settings. *Arizona Law Review, 17,* 29-32.

Greene, R., & Hoats, D. (1971). Aversive tickling: A simple conditioning technique. *Behavior Therapy, 2,* 389-393.

Griffin, J., Locke, B., & Landers, W. (1975). Manipulation of potential punishment parameters in the treatment of self-injury. *Journal of Applied Behavior Analysis, 8,* 458.

Halderman v. Pennhurst State School and Hospital, 446 F. Supp. 1295 (E.D. Pa. 1977), *aff'd. in part, rev'd. in part,* 612 F. 2d 84 (3d Cir. 1979), *rev'd. and remanded,* 451 U.S. 1 (1981)

Harris, S.L., & Romanczyk, R.G. (1976). Treating self-injurious behavior of a retarded child by overcorrection. *Behavior Therapy, 7,* 235-239.

Harris, S., & Wolchik, S. (1979). Suppression of self-stimulation: Three alternative strategies. *Journal of Applied Behavior Analysis, 12,* 185-198.

Herr, S. (1983). *Rights and advocacy for retarded people.* Lexington, MA: Lexington Books, D.C. Heath and Company.

Hersen, M., & Barlow, D.H. (1976). *Single case experimental designs: Strategies for studying behavior change.* NY: Pergamon Press.

Heschel, A. (1965). *Who is man?* Palo Alto, CA: Stanford University Press.

Higgs, R., Burns, G., & Meunier, G. (1980). Eliminating self-stimulatory vocalizations of a

profoundly retarded girl through overcorrection. *Journal of the Association for the Severely Handicapped, 5,* 264-269.

Hinerman, P., Jenson, W., Walker, G., & Petersen, P.B. (1982). Positive practice overcorrection combined with additional procedures to teach signed words to an autistic child. *Journal of Autism and Developmental Disorders, 12,* 253-263.

Kaimowitz v. Department of Mental Health, No. 73-19434-AW (Cir. Ct. Mich., filed July 10, 1973, *Prison Law Reporter, 2,* 433)

Kanner, L. (1964). *A history of the care and study of the mentally retarded.* Springfield, IL: Charles C Thomas.

Kazdin, A. (1980). Acceptability of alternative treatments for deviant child behavior. *Journal of Applied Behavior Analysis, 13,* 259-273.

Kazdin, A.E. (1982). *Single-case research designs: Methods for clinical and applied settings.* NY: Oxford University Press.

Kazdin, A.E., & Wilson, G.T. (1978). *Evaluation of behavior therapy: Issues, evidence, and research strategies.* Cambridge: Ballinger.

Kelly, J.A., & Drabman, R.S. (1977). Generalizing response suppression of self-injurious behavior through an overcorrection punishment procedure: A case study. *Behavior Therapy, 8,* 468-472. (a)

Kelly, J.A., & Drabman, R.S. (1977). Overcorrection: An effective procedure that failed. *Journal of Clinical Child Psychology, 6,* 38-40. (b)

Kircher, A., Pear, J., & Martin, G. (1971). Shock as punishment in a picture-naming task with retarded children. *Journal of Applied Behavior Analysis, 4,* 227-233.

Kissel, R.C., & Whitman, T.L. (1977). An examination of the direct and generalized effects of a play-training and overcorrection procedure upon the self-stimulatory behavior of a profoundly retarded boy. *American Association for the Education of the Severely/Profoundly Handicapped Review, 2,* 131-146.

Knecht v. Gillman, 488 F. 2d 1136 (8th Cir. 1973)

Knowlton, S. (1985). Demographic analysis of published studies using aversive procedures with persons who are handicapped. University of Kansas, Unpublished master's project, Lawrence.

Koegel, R., & Covert, A. (1972). The relationship of self-stimulation to learning in autistic children. *Journal of Applied Behavior Analysis, 5,* 381-387.

Koegel, R., Firestone, P., Kramme, K., & Dunlap, G. (1974). Increasing spontaneous play by suppressing self-stimulation in autistic children. *Journal of Applied Behavior Analysis, 7,* 521-528.

Kohlenberg, R. (1970). The punishment of persistent vomiting: A case study. *Journal of Applied Behavior Analysis, 3,* 241-245.

Lovaas, O.I., Schaeffer, B., & Simmons, J.Q. (1965). Building social behavior in autistic children by use of electric shock. *Journal of Experimental Research in Personality, 1,* 99-109.

Luce, S., Delquadri, J., & Hull, V. (1980). Contingent exercise: A mild but powerful procedure for suppressing inappropriate verbal and aggressive behavior. *Journal of Applied Behavior Analysis, 13,* 583-594.

Luckey, R., Watson, C., & Musick, J. (1968). Aversive conditioning as a means of inhibiting vomiting and rumination. *American Journal of Mental Deficiency, 73,* 139-142.

Luiselli, J.K., Helfen, C.S., Pemberton, B.W., & Reisman, J. (1977). The elimination of a child's in-class masturbation by overcorrection and reinforcement. *Journal of Behavior Therapy and Experimental Psychiatry, 8,* 201-204.

Luiselli, J.K., Pemberton, B.W., & Helfen, C.S. (1978). Effects and side effects of a brief overcorrection procedure in reducing multiple self-stimulatory behavior: A single case analysis. *Journal of Mental Deficiency Research, 22,* 287-293.

Mackey v. Procunier, 477 F. 2d 877 (9th Cir. 1973)

Maher v. Gagne, 448 U.S. 122 (1980)

Maine v. Thiboutot, 448 U.S. 1 (1980)

Martin, J., Weller, S., & Matson, J. (1977). Eliminating object-transferring by a profoundly retarded female by overcorrection. *Psychological Reports, 40,* 779-782.

Massey, P., & Insalaco, C. (1969). Aversive stimulation as applied to discrimination learning in mentally retarded children. *American Journal of Mental Deficiency, 74,* 269-272.

Matson, J., & DiLorenzo, T. (1984). *Punishment and its alternatives: A new perspective for behavior modification.* New York: Springer Publishing Co.

Matson, J.L., Esveldt-Dawson, K., & O'Donnell, D. (1979). Overcorrection, modeling, and reinforcement procedures for reinstating speech in a mute boy. *Child Behavior Therapy, 1,* 363-371.

Matson, J.L., Ollendick, T.H., & Martin, J.E. (1979). Overcorrection revisited: A long term follow-up. *Journal of Behavior Therapy and Experimental Psychiatry, 10,* 11-13.

Matson, J.L., Stephens, R.M., & Smith, C. (1978). Treatment of self-injurious behavior with overcorrection. *Journal of Mental Deficiency Research, 22,* 175-178.

Matthews v. Eldridge, 424 U.S. 319 (1976)

Measel, C.J., & Alfieri, P.A. (1976). Treatment of self-injurious behavior by a combination of

reinforcement for incompatible behavior and overcorrection. *American Journal of Mental Deficiency, 81,* 147-153.

Michigan Law Review (1976). Note: Regulation of electroconvulsive therapy. *Michigan Law Review, 75*(2), 363-412.

Mithaug, D. (1978). Case studies in the management of inappropriate behaviors during prevocational training. *American Association for the Education of the Severely/Profoundly Handicapped Review, 3,* 132-144.

Mithaug, D., & Hanawalt, D. (1977). Employing negative reinforcement to establish and transfer control of a severely retarded and aggressive nineteen year old girl. *American Association for the Education of the Severely/Profoundly Handicapped Review, 2,* 37-49.

Morse, S. (1981). Crazy behavior. *Southern California Law Review, 51,* 527-654.

Murphey, R., Ruprecht, M., Baggio, P., & Nunes, D. (1979). The use of mild punishment in combination with reinforcement of alternate behavior to reduce the self-injurious behavior of a profoundly retarded individual. *American Association for the Education of the Severely/Profoundly Handicapped Review, 4,* 187-195.

National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (1975). Washington: Author.

Neisworth, J.T., & Smith, R.M. (1973). *Modifying retarded behavior.* Boston: Houghton Mifflin Co.

Nietzel, M.T. (1979). *Crime and its modification: A social learning perspective.* New York: Pergamon Press.

O'Connor v. Donaldson, 422 U.S. 563 (1974)

Ollendick, T.H., Matson, J.L., Esveldt-Dawson, K., & Shapiro, E.S. (1980). Increasing spelling achievement: An analysis of treatment procedures utilizing an alternating treatments design. *Journal of Applied Behavior Analysis, 13,* 645-654.

Ollendick, T.H., Matson, J.L., & Martin, J.E. (1978). Effectiveness of hand overcorrection for typographically similar and dissimilar self-stimulatory behavior. *Journal of Experimental Child Psychology, 25,* 396-403.

Opton, E.M. (1975). Institutional behavior modification as a fraud and sham. *Arizona Law Review, 17,* 20-28.

Parham v. J.R., 442 U.S. 584 (1979)

Plotkin, R. (1978). Limiting the therapeutic orgy: Mental patients' right to refuse treatment. *Northwestern Law Review, 72,* 461-525.

Polvinale, R.A., & Lutzker, J.R. (1980). Elimination of assaultive and inappropriate sexual behavior by reinforcement and social restitution. *Mental Retardation, 18,* 27-30.

President's Commission on Mental Health (1978). *Report to the President.* Washington: Author.

Rachman, S., & Teasdale, J.D. (1969). Aversion therapy: An appraisal. In C.M. Franks (Ed.), *Behavior therapy: Appraisal and status* (pp. 279-320). New York: McGraw-Hill Book Co.

Reid, G., Tombaugh, T., & Heuvel, K. (1981). Application of contingent physical restraint to suppress stereotyped body rocking of profoundly mentally retarded persons. *American Journal of Mental Deficiency, 86,* 78-85.

Reilich, L.L., Spooner, F., & Rose, T.L. (1984). The effects of contingent water mist on the stereotypic responding of a severely handicapped adolescent. *Journal of Behavior and Experimental Psychiatry, 15,* 165-170.

Rennie v. Klein, 462 F. Supp. 1131 (D.N.J. 1978), *class injunction issued,* 467 F. Supp. 1294 (D.N.J. 1979), *modified,* 653 F. 2d 836 (3d Cir. 1981), *vacated and remanded,* 458 U.S. 1119 (1982), *on remand,* 720 F. 2d 266 (3d Cir. 1983).

Risley, T. (1968). The effects and side effects of punishing the autistic behaviors of a deviant child. *Journal of Applied Behavior Analysis, 1,* 21-34.

Roberts, P., Iwata, B.A., McSween, T.E., & Desmond, E.F. (1979). An analysis of overcorrection movement. *American Journal of Mental Deficiency, 83,* 588-594.

Rogers v. Okin, 478 F. Supp. 1342 (D. Mass. 1979), *aff'd. in part, rev'd. in part, and remanded,* 634 F. 2d 650 (1st Cir. 1980), *vacated and remanded sub nom.,* Mills v. Rogers, 457 U.S. 291 (1982), *later proceding,* Rogers v. Commissioner, 390 Mass. 489 (1983)

Rollings, J.P., Baumeister, A.A., & Baumeister, A.A. (1977). The use of overcorrection procedures to eliminate the stereotyped behaviors of retarded individuals: An analysis of collateral behaviors and generalization of suppressive effects. *Behavior Modification, 1,* 29-46.

Romanczyk, R.G., & Goren, E.R. (1975). Severe self-injurious behavior: The problem of clinical control. *Journal of Consulting and Clinical Psychology, 43,* 730-739.

Romanczyk, R. (1977). Intermittent punishment of self-stimulation effectiveness during application and extinction. *Journal of Consulting and Clinical Psychology, 45,* 53-60.

Rose, H. (1979). Effectiveness and generalization of overcorrection procedures with stereotyped behavior of a severely retarded adult. *American Association for the Education of the Severely/Profoundly Handicapped Review, 4,* 196-201.

Rosen, M., Clark, G., & Kivitz, M. (Eds.) (1976). *The history of mental retardation: Collected*

*papers.* Baltimore: University Park Press.

Rothman, D., & Rothman, S. (1984). *The Willowbrook wars.* New York: Harper & Row.

Rusch, F., Close, D., Hops, H., & Agosta, J. (1976). Overcorrection: Generalization and maintenance. *Journal of Applied Behavior Analysis, 9,* 498.

Sajwaj, T., Libet, J., & Agras, S. (1974). Lemon-juice therapy: The control of life-threatening rumination in a six-month old infant. *Journal of Applied Behavior Analysis, 7,* 557-563.

Sales, B., Powell, D.M., Van Duizend, R., & Associates (1982). *Disabled persons and the law: State legislative issues.* New York: Plenum Press.

Salzberg, B., & Napolitan, J. (1974). Holding a retarded boy at a table for 2 minutes to reduce inappropriate object contact. *American Journal of Mental Deficiency, 78,* 748-751.

Sarason, S., & Doris, J. (1979). *Educational handicaps, public policy, and social history: A broadened perspective on mental retardation.* New York: The Free Press.

Scheerenberger, R. (1983). *A history of mental retardation.* Washington: American Association on Mental Deficiency.

Schiamberg, L.B. (1985). *Human development.* New York: Macmillan Publishing Co.

Schwitzgebel, R. (1972). Limitations on the coercive treatment of offenders. *Criminal Law Bulletin, 4,* 267-320.

Sec'y. v. Institutionalized Juveniles, 442 U.S. 640 (1979)

Shapiro, M. (1974). Legislating the control of behavior control: Autonomy and the coercive use of organic therapies. *Southern California Law Review, 47,* 237-338.

Shapiro, E.S. (1979). Restitution and positive practice overcorrection in reducing aggressive-disruptive behavior: A long term follow-up. *Journal of Behavior Therapy and Experimental Psychiatry, 10,* 131-134.

Shapiro, E.S., Barrett, R.P., & Ollendick, T.H. (1980). A comparison of physical restraint and positive practice overcorrection in treating stereotypic behavior. *Behavior Therapy, 11,* 227-233.

Simpson, R.L., & Sasso, G.M. (1978). The modification of rumination in a severely emotionally disturbed child through an overcorrection procedure. *American Association for the Education of the Severely/Profoundly Handicapped Review, 3,* 145-150.

Singer, R. (1977). Consent of the unfree. *Law and Human Behavior, 1*(1), 1-43.

Singh, N., Manning, P., & Argell, M. (1982). Effects of an oral hygiene punishment procedure on chronic rumination and collateral behaviors in monozygous twins. *Journal of Applied Behavior Analysis, 15,* 309-314.

Singh, N.N., & Bakker, L.W. (1984). Suppression of pica by overcorrection and physical restraint: A comparative analysis. *Journal of Autism and Developmental Disorders, 14,* 331-341.

Sloan, W., & Stevens, H. (1976). *A century of concern: A history of the American Association on Mental Deficiency.* Washington: American Association on Mental Deficiency.

Smith, P.S., Britton, P.G., Johnson, M., & Thomas, D.A. (1975). Problems involved in toilet training profoundly mentally handicapped adults. *Behavior Research and Therapy, 13,* 301-307.

Smith, S. (1980). Constitutional privacy in psychotherapy. *George Washington Law Review, 49*(1), 1-60.

Southern California Law Review (1972). Note: Prisoners and mental patients. *Southern California Law Review, 45,* 616-684.

Sulzer-Azaroff, B., & Mayer, G.R. (1986). *Achieving educational excellence using behavioral strategies.* NY: Holt, Rinehart, and Winston.

Tanner, B., & Zeiler, M. (1975). Punishment of self-injurious behavior using aromatic ammonia as the aversive stimulus. *Journal of Applied Behavior Analysis, 8,* 53-57.

Tate, B.G. (1972). Case study: Control of chronic self-injurious behavior by conditioning procedures. *Behavior Therapy, 3,* 72-83.

Tate, B.G., & Baroff, G. (1966). Aversive control of self-injurious behavior in a psychotic boy. *Behavior Research & Therapy, 4,* 281-287.

Tawney, J.W., & Gast, D.L. (1984). *Single subject research in special education.* Columbus, OH: Charles E. Merrill Publishing Co.

Tennenbaum, J. (1983). ECT regulation reconsidered. *Mental Disability Law Reporter, 7*(2), 148-157.

Terman, L.M. (1916). *The intelligence of school children.* Boston: Houghton-Mifflin.

*Torture in the eighties.* (1984). London: Amnesty International Publications.

Tough, J., Hawkins, R., McArthur, M., & Van Ravenswaay, S. (1971). Modification of enuretic behavior by punishment: A new use for an old device. *Behavior Therapy, 2,* 567-574.

Turnbull, H.R. (Ed.) (1978). *The consent handbook.* Washington: American Association on Mental Deficiency.

Turnbull, H.R. (1979). Law and the mentally retarded citizen. *Syracuse Law Review, 30,* 1093-1143.

Turnbull, H.R. (Ed.) (1981). *The least restrictive alternative: Principle and practice.* Washington: American Association on Mental Deficiency.

Turnbull, H.R., Brotherson, M.J., Czyewski,

M.J., DePazza-Conway, M., Esquith, D., Otis, A., Summers, J.A., & Van Reusen, A. (1983). A policy analysis of the "least restrictive education" of handicapped children. *Rutgers Law Journal, 14,* 489-540.

Turnbull, H.R., Guess, D., Backus, L., Barber, P., Fiedler, C., Helmstetter, E., & Summers, J.A. (1986). A model for analyzing the moral aspects of Special Education and behavioral interventions: The moral aspects of aversive procedures. In P. Dokecki & R. Zaner (Eds.), *Ethics and decision-making for persons with severe handicaps: Toward an ethically relevant research agenda.* Baltimore: Paul H. Brookes Publishing Co.

Tyor, P.L., & Bell, L.V. (1984). *Caring for the retarded in America: A history.* Westport, CT: Greenwood Press.

Watson, L.S. (1967). Application of operant conditioning techniques to institutionalized severely and profoundly retarded children. *Mental Retardation Abstracts, 4,* 1-18.

Webster, D.R., & Azrin, N.H. (1973). Required relaxation: A method of inhibiting agitative-disruptive behavior of retardates. *Behavior Research and Therapy, 11,* 67-78.

Wehman, P., Schutz, R., Renzaglia, A., & Karan, O. (1977). The use of positive practice training in work adjustment with two profoundly retarded adolescents. *Vocational Evaluation and Work Adjustment Bulletin, 10,* 14-22.

Wells, K.C., Forehand, R., & Hickey, K. (1977). Effects of a verbal warning and overcorrection on stereotyped and appropriate behavior. *Journal of Abnormal Child Psychology, 5,* 387-403.

Wells, K.C., Forehand, R., Hickey, K., & Green, K.D. (1977). Effects of a procedure derived from the overcorrection principle on manipulated and nonmanipulated behaviors. *Journal of Applied Behavior Analysis, 10,* 679-687.

Wexler, D. (1981). *Mental health law: Major issues.* New York: Plenum Press.

Wolfensberger, W. (1975). The origin and nature of our institutional models. In U.S. President's Committee on Mental Retardation (1975), *Changing Patterns in Residential Services for the Mentally Retarded.* Washington: Author.

Wolfensberger, W. (1980). Research, empiricism, and the principle of normalization. In R.J. Flynn & K.E. Nitsch (Eds.), *Normalization, social integration, and community services* (pp. 117-129). Baltimore: University Park Press.

Wood, F.H., & Lakin, K.C. (1978). *Punishment and aversive stimulation in special education: Legal, theoretical, and practical issues in their use with emotionally disturbed children and youth.* Minneapolis: Advanced Training Institute for Trainers of Teachers for Seriously Emotionally Disturbed Children and Youth.

Wood, F.H. (1978). Punishment and special education: Some concluding remarks. In F.H. Wood and K.C. Lakin (Eds.), *Punishment and aversive stimulation in special education: Legal, theoretical, and practical issues in their use with emotionally disturbed children and youth* (pp. 119-122). Minneapolis: Advanced Training Institute for Trainers of Teachers for Seriously Emotionally Disturbed Children and Youth.

Wood v. Strickland, 420 U.S. 308 (1975)

Wyatt v. Stickney, 344 F. Supp. 387 (M.D. Ala. 1972), *aff'd. in part, rev'd. in part, sub nom.,* Wyatt v. Aderholt, 503 F. 2d 1305 (5th Cir. 1974)

Yeakel, M.H., Salisbury, L.L., Jr., Greer, S.L., & Marcus, L.F. (1970). An appliance for auto-induced adverse control of self-injurious behavior. *Journal of Experimental Child Psychology, 10,* 159-169.

Youngberg v. Romeo, 457 U.S. 307 (1982)

Zehr, M.D., & Theobald, D.E. (1978). Manual guidance used in a punishment procedure: The active ingredient in overcorrection. *Journal of Mental Deficiency Research, 22,* 263-272.

Zlotnik, D. (1981). First do no harm: Least restrictive alternative analysis and the right of mental patients to refuse treatment. *West Virginia Law Review, 83*(3), 376-448.

## Table 1
## Treatment of Toileting by Punishment [a]

| Article | Subjects N | Subjects Type | Target behavior | Description of treatment | Experimental design | Experimental conditions | Length of procedure | Length of session | Effectiveness of treatment | Effectiveness at follow-up(D/A) | Length of follow-up | Generalization (D/A) | Side effects (D/A) Positive | Side effects (D/A) Negative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tough et al. (1971) | 1 Blind, emotionally disturbed, moderately mentally retarded | Nocturnal enuresis | Cold bath, reprimand, DRO, dry/dress self | A B | A = BL<br>B = cold bath + reprimand + DRO + dry/dress self | | All night | 100% reduction in 22 nights | 100% reduction (D/A) | 18 months | | Behavior maintained by DRO alone (D) | |

[a] N = number; D/A = data (D)/anecdotal (A) report; BL = baseline; DRO = differential reinforcement of other behavior.

## Table 2
## Treatment of Inappropriate Oral Behavior by Punishment [a]

| Article | Subjects N | Subjects Type | Target behavior | Description of treatment | Experimental design | Experimental conditions | Length of procedure | Length of session | Effectiveness of treatment | Effectiveness at follow-up (D/A) | Length of follow-up | Generalization (D/A) | Side effects (D/A) Positive | Side effects (D/A) Negative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Luckey et al. (1968) | 1 | Severely mentally retarded | Vomiting, rumination | Electric shock | AB | A = BL<br>B = Shock | 1 sec. | 2-12 hours | 100% reduction in 6 sessions. Recovery occured in sessions 24-31 | | | | 1. Eating behaviors, play, affection, and attention improved (A)<br>2. Tantrums decreased (A) | |
| Kohlenberg (1970) | 1 | Severely mentally retarded | Vomiting | Electric shock | AB | A = BL<br>B = Shock | Less than 1 sec. | 80 min. | Near 100% reduction in 4 sessions (2 days) | 85% reduction (D)<br>Low rate (?)<br>Increasing (A) | 25 days<br>10 mos.<br>12 mos. | | Weight gain (D) | Increase in target behavior at onset of treatment (D) |
| Sajwaj et al. (1974) | 1 | Developmentally delayed | Rumination | Lemon juice | ABAB | A = BL<br>B = lemon juice | | 20 min., 1-6 times a day | 92%-96% reduction in 10 sessions | | | | 1. Increases in attention to and from adults (A)<br>2. Developmental gains (A)<br>3. Weight gain (D) | |
| Becker et al. (1978) | 1 | Profoundly mentally retarded | Rumination | Lemon juice | ABAB | A = BL<br>B = lemon juice | | 33 sessions (about 2 days) | 67% reduction in 3 days. Behavior consisted mostly of lip smacking | 100% reduction (D)<br>Readmitted for treatment (A) | 6 mos.<br>11 mos. | | 1. Crying reduced 80% (D)<br>2. Touching objects increased 87% (D)<br>3. Stereotyped behavior reduced 33% during follow-up (D)<br>4. Smiles, interaction, babbling increased (D) | 1. Stereotyped behavior increased during intervention (D)<br>2. Head slaps, rocking, head weaving began, but disappeared at follow-up (D) |
| Blount et al. (1982) | 2 | Profoundly mentally retarded | Diurnal bruxism | Ice to face | Multiple BL across 2 subjects (AB) | A = BL<br>B = ice to face | 6-8 sec. | 15 min., 3 times a day | 82%-87% reduction in 27-33 days | | | Generalized to 2 persons (A), 2 places (A), and to 2 nontreatment time periods (D) | Increases in laughter and play (A) | Crying (A) |
| Singh and Bakker (1984) | 2 | Profoundly mentally retarded | Pica | Physical restraint, OC | Alternating treatment (A,B/C) | A = BL<br>B = restraint<br>C = OC | 10 sec. and 10 sec. quiet; 15 min. OC | 15 min. a session, 3 sessions a day | 90%-97% reduction in 10 days. Punishment slightly more effective than OC | | | 1. Pica-related behaviors reduced (D)<br>2. No effect on nontarget behaviors (D) | Therapists preferred restraint to OC (A) | Subjects struggled and resisted (A) |

[a] N = number; D/A = data (D)/anecdotal (A) report; BL = baseline; sec. = seconds; min. = minutes; mos. = months; OC = overcorrection.

## Table 3
### Treatment of Stereotyped Behaviors by Punishment [a]

| Article | Subjects N | Subjects Type | Target behavior | Description of treatment | Experimental design | Experimental conditions | Length of procedure | Length of session | Effectiveness of treatment | Effectiveness at follow-up (D/A) | Length of follow-up | Generalization (D/A) | Side effects (D/A) Positive | Side effects (D/A) Negative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Baumeister and Forehand (1972) | 3 | Mentally retarded | Body rocking | Electric shock | AB | A = BL<br>B = shock | .5 sec. | 25 min. | 100% reduction after 5 days | 100% reduction for 1 subject (D) | 10 mos. | Effects limited to treatment setting (D) | | |
| Koegel and Covert (1972) | 2 | Autistic | Rocking, waving hands/objects before eyes, light gazing, hand gripping, hair twirling, hand/arm flapping, vocals, finger manipulation | "No," handslap | Subject 1: ABAB<br>Subject 2: ABA | A = BL<br>B = "No" + handslap | | 10 min. | 100% reduction in 40 trials | | | | Correct discrimination increased nearly 100% in 300-400 trials (D) | |
| Foxx and Azrin (1973) | 2 | Severely mentally retarded | Mouthing objects or hand | DRO slap, OC, distasteful solution | Subject 1: ABCAB<br>Subject 2: AECBD | A = noncontingent reinforcement<br>B = DRO<br>C = slap<br>D = OC<br>E = distasteful solution on hand | | 15 min., 2 times a day | 95% reduction for 1 subject, increased for 2nd subject. 100% reduction with OC. 40% reduction with distasteful solution | | | | | |
| Koegel et al. (1974) | 2 | Autistic | 13 and 31 different behaviors for subjects 1 and 2, respectively | "No," slap, physical restraint | ABA within a multiple BL across 2 subjects | A = BL<br>B = "No" + slap or restraint | | 5 min., 2-6 times a day | 90% reduction in 16 sessions for 1 subject, 60% reduction in 40 sessions for 2nd subject | | | | Appropriate play increased significantly in 16-40 sessions (D) | |
| Romanczyk (1977) | 2 | Autistic | Twirling, finger manipulation, rocking, thumbsucking | "No," slap | Study 1, Subject 1: Room 1--ABAB; Room 2--ACAC; Room 3--A.<br>Study 2, Subject 2: Room 1--ABAB; Room 2--ACAC | A = BL<br>B = "No" + slap (FR 1)<br>C = "No" + slap (VR 5) | | 1. 20 min. per room per session<br>2. 20 min. per room per session | 1. 98% reduction in 8 sessions<br>2. 90% reduction in 8 sessions | | | No effect in nontreatment setting (D).<br>No effect on nontarget behaviors (D) | 1. Increase in interaction with trainer and toys (A)<br>2. Increase in learning performance (D) | |

## Table 3
(continued)

| Article | Subjects N | Subjects Type | Target behavior | Description of treatment | Experimental design | Experimental conditions | Length of procedure | Length of session | Effectiveness of treatment | Effectiveness at follow-up (D/A) | Length of follow-up | Generalization (D/A) | Side effects (D/A) Positive | Side effects (D/A) Negative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Reid et al. (1981) | 7 | Profoundly mentally retarded | Body rocking | Physical restraint | Subjects 1-3: ABAC Subjects 4-7: ACAB | A = BL<br>B = restraint in upright position<br>C = restraint in down position | 1 min. | 20 min. | Reduction in 10 days of 100%, 91%, 87%, 79%, 70%, 67%, and 49% for Subjects 1-7 | | | No effect in nontreatment settings (A) | 1. By end of study, a touch only was needed to stop behavior (A)<br>2. Minimal staff training needed (A) | |
| Friman et al. (1984) | 1 | Autistic, severely mentally retarded | Hand touching | Water mist, lemon juice, vinegar | ABACADAB | A = BL<br>B = water mist<br>C = lemon juice<br>D = vinegar | | 5 min. | 68% reduction (1st B) and 90% (2nd B) in 15 sessions<br>50% reduction in 6 sessions with vinegar<br>10% reduction in 3 sessions with lemon juice | | | | Staff preferred water mist to other treatments (A) | To oral substances there was twisting, flailing, grimacing, spitting, coughing, crying, screaming (A) |
| Rollich et al. (1984) | 1 | Deaf-blind, severely mentally retarded | Placing objects over eyes or face | Water mist | Multiple BL across 3 settings (AB) | A = BL<br>B = water mist | | 3 hours | 100% reduction in 1-14 days | 100% reduction (D) | 17 mos. | Generalized to second trainer (D) | Improvement in social acceptability, learning and workshop performance (A) | Closed eyes and winced (A) |

[a] N = number; D/A = data (D)/anecdotal (A) report; BL = baseline; sec. = seconds; min. = minutes; mos. = months; DRO = differential reinforcement of other behavior; OC = overcorrection.

# Table 4
## Treatment of Aggression-Disruption by Punishment [a]

| Article | Subjects N | Subjects Type | Target behavior | Description of treatment | Experimental design | Experimental conditions | Length of procedure | Length of session | Effectiveness of treatment | Effectiveness at follow-up (D/A) | Length of follow-up | Generalization (D/A) | Side effects (D/A) Positive | Side effects (D/A) Negative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Birnbrauer (1968) | 1 | Autistic | Incorrect button push, picture ripping, object breaking | Electric shock, verbal warning, hand slap, "No" | Multiple BL across 3 behaviors (ABC-BD-BD) | A = intermittent "No" or "No" and slap + verbal warning for incorrect pushes<br>B = BL<br>C = variable ratio shock + instruction<br>D = warning + shock for each incorrect | Less than 1 sec. | 60-90 min. | 100% reduction of ripping after 3 shocks, and breaking after 1 shock | | | 1. Effects did not generalize to other persons or settings (D)<br>2. Experimenter's verbal warning did not generalize to novel materials (D) | Verbal warning became conditioned punisher for some behavior (D) | Screaming, running from trainer, hitting self (A) |
| Risley (1968) | 1 | Autistic | Climbing, aggression | Electric shock verbal, warning, DRI, TO | Climbing: clinic-ABC home-DE<br>Aggression: E | A = "No" + TO + DRI for all climbing<br>B = "No" + TO + DRI for climbing in bathroom<br>C = "No" + DRI + shock<br>D = BL<br>E = shock | 1 sec. | 20-30 min. | 100% reduction in climbing with 7 shocks in clinic, in 18 days at home<br>100% reduction in aggression with 17 shocks | | | 1. Effects did not generalize to home or to other furniture added to setting (D)<br>2. Effects did not generalize to absence of trainer (D) | 1. "No" became conditioned punisher (D)<br>2. Eye contact increased five-fold under DRI (D) | Increase in similar nontarget behavior (D) |
| Greene and Hoats (1971) (also reported under self injury) | 1 | Blind, mentally retarded | Pinching, scratching, biting, hitting, pulling hair/clothing, banging on walls/furniture, stamping feet, whining, messing up self, fake seizures | Tickling | AB | A = BL<br>B = tickling | 3-5 sec. | | 60% reduction in 13 weeks | | | | | |
| Conway and Bucher (1974) | 1 | Profoundly mentally retarded | Tantrums | Shaving cream in the mouth | AB | A = BL<br>B = Shaving cream | | All day | 90%-100% reduction in 5 weeks | 1 or less per week (?) | 6 mos. | | Presentation of dispenser often stopped tantrums (A) | Avoidance response (A) |

## Table 4
(Continued)

| Article | Subjects N | Subjects Type | Target behavior | Description of treatment | Experimental design | Experimental conditions | Length of procedure | Length of session | Effectiveness of treatment | Effectiveness at follow-up (D/A) | Length of follow-up | Generalization (D/A) | Side effects (D/A) Positive | Side effects (D/A) Negative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Salzberg & Napolitan (1974) | 1 | Profoundly mentally retarded | Playing with doors, staring out windows | Physical restraint of arms outstretched, "No" | ABABAB | A = BL<br>B = restraint + "No" | 2 min. and until quiet for 10-15 sec. | 5 min., 1-4 times a day | 89% reduction after 2 sessions (1 day) | | | | | |
| Doleys et al. (1976) | 4 | 2 educably mentally retarded<br>2 autistic/mentally retarded | Noncompliance to command to interact with object | Loud scolding voice, silent glare, OC, TO | Subjects 1-4: ABA, ACABA, ADACABA, and ADACABA | A = BL<br>B = scolding + glare<br>C = OC<br>D = TO | 40 + sec. | 30-40 min. | 72%-75% reduction in 2 sessions under B for 2 subjects, 85% reduction for 3rd, and 90% for 4th Punishment more effective than OC or TO | | | 1. Effects generalized to familiar and unfamiliar tasks (D), and to nontreatment time periods (D)<br>2. Nontarget aggressive behavior reduced by 100% under Condition B for one subject (D) | | Startle, soiling pants, covering eyes, crying (A) |
| Cook et al. (1978) | 1 | Severely mentally retarded | Masturbation | Lemon juice, hand hit, "No" | Multiple BL across 2 settings (ABC) | A = "No" + hand hit<br>B = ignore<br>C = lemon juice | | | 100% reduction in13-16 days | 100% reduction (D) | 6 mos. | | | |
| Fonagy and Slade (1982) | 3 | Chronic schizophrenics | Auditory hallucinations | White noise at 80 dB | Subjects 1-3: ABCAD - E<br>ACBAD - E<br>ACDAB - E<br>Within each session: (A) - (B, C, or D) - (A) | A = BL<br>B = white noise as neg. reinf.<br>C = white noise as punisher<br>D = random white noise<br>E = most effective of B, C, or D | | 45 min., once a week; only for 15 min. of session was B, C, or D administered | White noise more effective as neg. reinf. for 2 of 3 subjects 50%, 40%, 14% reduction for subjects 1, 2, 3 after 3 sessions | | | Effects generalized to nontreatment situations (A: self report by one subject) | | |

[a]N = number; D/A = data (D)/anecdotal (A) report; BL = baseline; sec. = seconds; min. = minutes; DRI = differential reinforcement of incompatible behavior; TO = timeout; OC = overcorrection; neg. reinf. = negative reinforcer.

# Table 5
## Treatment of Self Injury by Punishment [a]

| Article | Subjects N | Subjects Type | Target behavior | Description of treatment | Experimental design | Experimental conditions | Length of procedure | Length of session | Effectiveness of treatment | Effectiveness at follow-up (D/A) | Length of follow-up | Generalization (D/A) | Side effects (D/A) Positive | Side effects (D/A) Negative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tate & Baroff (1966) | 1 | Blind, psychotic | Head banging/punching, face slapping/punching, hitting shoulder with chin, kicking self | Electric shock | AB | A = BL<br>B = shock | .5 sec. | 4-9 hours | Near 100% reduction after 3 days | | | | Enjoys walks, playground, games involving direction following (A) | Startle, avoidance (A) |
| Yeakel et al. (1970) | 1 | Autistic | Head banging | Electric shock | | Protective helmet + autoinduced shock | .5 sec. | | 100% reduction (anecdotal report) | | | | | |
| Corte et al. (1971) | 4 | Profoundly mentally retarded | Face slapping/banging, hair pulling, face scratching, finger biting | Electric shock | Study 1, 2: Subjects 1, 2--multiple BL across 2 settings (AB)<br>Study 3: Subject 2--multiple BL across 4 trainers (AB)<br>Study 4: Subject 3--multiple BL across 2 settings (AB)<br>Study 5: Subject 4-- AB | A = BL<br>B = shock | | 1, 2. 15 min., 2 times a day<br>3. 15 min., 1-4 times a day<br>4. 5 min. a day<br>5. 15 min. a day | 1. 100% reduction in 2-6 sessions<br>2. 100% reduction in 1-2 sessions<br>3. 100% reduction in 6 days<br>4. 100% reduction in 10 days<br>5. Shock more effective than DRO | Behavior recovered in at least 1 subject (?) | 2 mos. | No generalization in absence of trainer (D), nor to non-treatment settings (D) or trainers (D) | | Rapid increase in target behavior at onset of treatment (D) |
| Greene & Hoats (1971) (also reported under aggression-disruption) | 1 | Blind, mentally retarded | Hand biting, head banging | Tickling | AB | A = BL<br>B = tickling | 3-5 sec. | | 62% reduction in 7 weeks | | | | | 50% increase in self injury in first week of treatment (D) |
| Tate (1972) | 1 | Blind, mentally retarded | Head banging, kicking self, head hitting, biting self | Electric shock | Shock used whenever self injury occurred at high rate | | Varied | 17-40 min. | 100% reduction after 4 sessions | No self injury (A)<br>Some self injury (A) | 7 mos.<br>36 mos. | | | |

## Table 5
(continued)

| Article | Subjects N | Subjects Type | Target behavior | Description of treatment | Experimental design | Experimental conditions | Length of procedure | Length of session | Effectiveness of treatment | Effectiveness at follow-up (D/A) | Length of follow-up | Generalization (D/A) | Side effects (D/A) Positive | Side effects (D/A) Negative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Griffin et al. (1975) | 1 | Profoundly mentally retarded, blind | Self injury | Electric shock, hair pulls, restraint | | A = hair pulls<br>B = hair pulls + shock + restraint<br>C = same as B, but contingent on antecedent | | 30-480 min. | Partial reduction with hair pulls; shock + restraint further suppressed behavior<br>100% reduction in Condition C | 100% reduction (D) | 12, 24, & 36 mos. | Generalization to all settings at 36 months (?) | | |
| Romanczyk & Goren (1975) | 1 | Autistic | Head banging | Electric shock | Home: AB<br>Clinic: CDE | A = BL<br>B = shock<br>C = shock + resp. prev.+ restraint + DRO<br>D = shock + restraint at start of raise of hand<br>E = shock + restraint for head bang | .3 sec. | 20 min. | 98% reduction (to 125/min.) in 2 sessions with shock. Condition E was most effective (0-11 hits per min.) | Requires attachment of electrodes at home, partial restraint needed at school (A) | 12 mos. | | Increase in adaptive behavior (A) | 1. Rapid increase when device malfunctioned (D)<br>2. Unable to remove electrodes without behavior increase (A)<br>3. Shock became less effective (D) |
| Tanner & Zeiler (1975) | 1 | Autistic | Slapping self | Aromatic ammonia | ABCAC | A = BL<br>B = ammonia<br>C = ammonia for antecedent | For length of slapping | 3-5 min. | 96% reduction in 3 days under B<br>100% reduction in 1 day under C | 100% reduction (D) | 21 days | | | 1. Violent turning of head, struggling (A)<br>2. Scabs formed on nose (A)<br>3. Trainers irritated by fumes (A) |
| Altman et al. (1978) | 2 | 1 Severely mentally retarded<br>1 Moderately mentally retarded | Hair pulling, hand biting | Aromatic ammonia, DRO, "NO" | Study 1, Subject 1: ACADAC, fading of DRO, multiple BL across 3 settings (BE)<br>Study 2, Subject 2: Multiple BL across 3 persons (FG) | A = BL + DRO<br>B = BL<br>C = DRO + ammonia as neg. reinf.<br>D = DRO + ammonia for 3 sec.<br>E = ammonia for 3 sec.<br>F = BL + "No" + remove hand<br>G = ammonia for time equal to duration of biting | 1. Up to 3 sec.<br>2. ? | 1. 90 min.<br>2. ? | 1. Near 100% reduction in hair pulls in 1 week under Condition D<br>2. Near 100% reduction in 1-20 doses under Condition G | 1. Near 100% reduction (D)<br>2. 100% reduction (D) | 7 weeks<br>12 mos. | 1. Implementation in clinic by parents resulted in reduced BL in other settings (D)<br>2. Effects generalized to non target behaviors (D) | | Initial increase in target behavior at onset of treatment (D) |

## Table 5
(continued)

| Article | Subjects N | Subjects Type | Target behavior | Description of treatment | Experimental design | Experimental conditions | Length of procedure | Length of session | Effectiveness of treatment | Effectiveness at follow-up (D/A) | Length of follow-up | Generalization (D/A) | Side effects (D/A) Positive | Side effects (D/A) Negative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Anderson et al. (1978) | 5 | Mildly mentally retarded | Finger biting | Electric shock, reinforcement, TO | Subjects 1-5, respectively: ABCE, ABDE, ABCDE, ABACDA, and AE | A = resp. prev.<br>B = shock + resp. prev.<br>C = DRO + resp. prev.<br>D = TO<br>E = TO + DRO | TO was for 5 sec. | 30 min. | TO, DRO, and TO + DRO all were more effective than shock which had no effect or increased behavior | Near 100% at school (D); at home, near 100% for 3 subjects; all required restraint while asleep at home (D) | 21-24 mos. | | | |
| Baumeister & Baumeister (1978) | 2 | Severely mentally retarded | Face and leg slapping, hair pulling, rapid movement of fingers in/out of mouth | Aromatic ammonia | AB | A = BL<br>B = ammonia on variable schedule for 1 subject, continuous for other subject | Until fumes inhaled | 5-15 min. | 100% Reduction after 6 sessions (30-35 doses per subject) | 3 responses per 5 hours for 1 subject, no occurrences for second subject (D) | 4 mos. | No generalization to non-treatment settings (D) | | Turning head away, struggling, coughing, crying, tearing, mucous discharge (A) |
| Favell et al. (1978) | 3 | Profoundly mentally retarded | Eye poking, arm biting, hair pulling, head banging, face slapping | Lemon juice, restraint, distraction | Study 1, Subject 1: ABCACBC<br>Study 2, Subjects 2, 3: Multiple BL across two subjects (AD) plus ADAD for one subject | A = BL<br>B = lemon juice<br>C = lemon juice + restraint + distraction<br>D = restraint + distraction | 1. 3-5 min. restraint<br>2. 3.5 min. | 1. 30-60 min.<br>2. 20-75 min. | 1. 91% reduction in 1 day under Condition B, 100% under Condition C<br>2. 90%-100% reduction in 1 day under Condition D | 100% reduction (A) | 10 mos. | | | |
| Murphey et al. (1979) | 1 | Profoundly mentally retarded | Self choking | Water squirt, DRO, "No choking" | BAB | A = BL<br>B = "No choking" + water squirt + DRO | Water squirt every 2 sec. until behavior ceased | 6 hours | 91% reduction in 25 days under Condition B | 15 a day (D)<br>300 a day–different setting (D) | 8 mos.<br>20 mos. | Some generalization to non-treatment settings (A) | "No choking" became effective in disrupting behavior (A) | |
| Dorsey et al. (1980) | 8 | Profoundly mentally retarded | Mouthing, hand biting, head banging, skin tearing | Water mist, "No," DRO | Study 1, Subjects 1-7: ABAB<br>Study 2, Subjects 7, 8: Setting 1–ACDE<br>Setting 2–ACFE | A = BL<br>B = water mist<br>C = "No"<br>D = "No" + DRO + water mist<br>E = "No" + DRO<br>F = DRO | | 1. 20-30 min.<br>2. 20 min. | 1. 80% reduction in 4 sessions, 100% after 1-11 sessions under Condition B<br>2. Adding water mist to other treatments reduced behavior 90% in 4 sessions | | | | "No" became effective treatment after pairing with water mist (D) | |

[a] N = number; D/A = data (D)/anecdotal (A) report; BL = baseline; sec. = seconds; DRO = differential reinforcement of other behavior; min. = minutes; mos. = months; neg. reinf. = negative reinforcer.

## Table 6
## Treatment of Adaptive Behavior by Punishment [a]

| Article | Subjects N | Subjects Type | Target behavior | Description of treatment | Experimental design | Experimental conditions | Length of procedure | Length of session | Effectiveness of treatment | Effectiveness at follow-up (D/A) | Length of follow-up | Generalization (D/A) | Side effects (D/A) Positive | Side effects (D/A) Negative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Massey & Insalaco (1969) | 40 | Moderately mentally retarded | Discrimination learning | White noise at 95dB | Four balanced groups (ABCD) | A = control, candy for each correct<br>B = candy for correct, noise for incorrect<br>C = noise + candy for correct<br>D = noise + candy for correct, noise for incorrect | .5 sec. | | Fewest errors made by Group B, most errors by Group A | | | | | |
| Kircher et al. (1971) | 2 | Severely mentally retarded | Inattention, incorrect responding | Shock, "No," reinforcement for correct response | Study 1, Subjects 1, 2: Alternating treatment (AB)<br>Study 2, Subjects 1, 2: Alternating treatment (AC) | A = reinforcement + "No" for incorrects or inattention<br>B = reinforcement + "No" and shock for each incorrect/inattention<br>C = same as B, but "No" + shock on variable schedule | 1, 2: 25 msec. | 1, 2 40 min., 20 min. each treatment | 67%, 75% reduction in 18 sessions for Subjects 1, 2; 8 vs. 1 & 6 vs. 3 words learned by Subjects 1, 2 under B | | | | Positive cooperative relationship with trainer (A) | Hitting table, winding (A) |
| Favell et al. (1978) (also reported under self injury) | 1 | Profoundly mentally retarded | Place marble in hole | Physical restraint | ABABCB | A = BL<br>B = restraint<br>C = no restraint control period | 30 sec. | 40 trials (23 min.) | 92% increase in responding within 4 sessions under B | | | | | |

[a] N = number; D/A = data (D)/anecdotal (A) report; sec. = seconds; msec. = milliseconds; BL = baseline.

## Table 7
### Summary of Effectiveness of Punishment

| Effectiveness | Toileting | | Inappropriate oral | | Stereotyped | | Aggression-disruption | | Self injury | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Studies | Subjects | Studies | Subjects | Studies | Subjects | Studies | Subjects | Studies | Subjects | Studies | Subjects |
| Punishment reduced target behavior | | | | | | | | | | | | |
| Near 100%/100% | | | 2 | 2 | 3 | 5 | 1 | 1 | 8 | 19 | 14 | 27 (36%)[a] |
| 90%-96% | | | 2 | 3 | 2[b] | 3 | 1 | 1 | | | 5[b] | 7 (9%) |
| 80%-89% | | | 1 | 2 | [b] | 1 | 1 | 1 | | | 2[b] | 4 (5%) |
| 70%-79% | | | | | [b] | 2 | | | | | [b] | 2 (3%) |
| Less than 70% | | | 1 | 1 | 1[b] | 4 | 2 | 4 | [c] | 1 | 4[b] | 10 (13%) |
| Other | | | | | [b] | 1[d] | | | | | [b] | 1[d] (1%) |
| Punishment & other method reduced target behavior | | | | | | | | | | | | |
| Near 100%/100% | 1 | 1 | | | 2 | 3 | 2 | 2 | 3 | 3 | 8 | 9 (12%) |
| 90%-96% | | | | | [b] | 1 | 1 | 1 | 1[b] | 5 | 2[b] | 7 (9%) |
| 80%-89% | | | | | | | [b] | 1 | | | [b] | 1 (1%) |
| 70%-79% | | | | | | | [b] | 2 | | | [b] | 2 (3%) |
| Other | | | | | | | | | 1 | 5 | 1 | 5 (7%) |
| Total | 1 | 1 | 6 | 8 | 8[b] | 20 | 8[b] | 13 | 13[b] | 33 | 36 | 75 |

[a] Percent of total number of subjects from all studies. [b] Study recorded elsewhere in this target behavior category. [c] Study recorded in aggression-disruption. [d] Target behavior increased.

## Table 8
### Summary of Maintenance of Punishment Effects

| Treatment category | Proportion of studies with maintenance information | Maintained | | | Not Maintained | | |
|---|---|---|---|---|---|---|---|
| | | D/A[a] | Months[b] | Subjects[c] | D/A | Months | Subjects |
| Toileting | 1/1 | D | 18 | 1 | | | |
| Inappropriate oral | 2/6 | | | | A[d] | 12 | 1 |
| | | | | | A | 12 | 1 |
| Stereotyped | 2/8 | [e] | 17 | 1 | | | |
| | | D | 10 | 3 | | | |
| Aggression-disruption | 2/8 | [e] | 6 | 1 | | | |
| | | D | 6 | 1 | | | |
| Self injury | 10/13 | D[f] | 21-24 | 5 | | | |
| | | D | 34 | 1 | [e] | 2 | 1 of 4 |
| | | D | 1 | 1 | A[d] | 36 | 1 |
| | | A | 10 | 1 | D[d] | 4 | 1 of 2 |
| | | D[g] | 8 | 1 | | | |
| | | D | 2, 12 | 1, 1 | | | |
| | | D | 12 | 1 | | | |
| Adaptive | 0/2 | | | | | | |

[a] Data (D)/anecdotal (A). [b] Length of follow-up in months. [c] Number of subjects participating in study. [d] Target behavior beginning to increase. [e] Could not be determined. [f] Maintenance of effects from timeout and differential reinforcement procedures. [g] Effect not maintained at 20 months; however, measure was taken in a different setting.

## Table 9
## Summary of Generalization of Effects of Punishment

| Treatment category | Proportion of studies with generalization information | Generalization | | | Description of results |
|---|---|---|---|---|---|
| | | D/A[a] | Y/N[b] | Subjects[c] | |
| Toileting | 0/1 | | | | |
| Inappropriate oral | 2/6 | D/A | Y | 2 | Reduction of bruxism generalized to two other persons (A), to two other places (A), and to two nontreatment time periods (D). |
| | | D | Y/N | 2 | Pica-related behaviors were also reduced; no change in other adaptive or maladaptive behaviors. |
| Stereotyped | 4/8 | D | Y | 1 | Reduction of face covering generalized to a second trainer. |
| | | D | N | 3 | Reduction of body rocking did not generalize to nontreatment settings. |
| | | D | N | 2 | Reduction in behaviors did not generalize to nontreatment setting or to nontarget behavior. |
| | | A | N | 7 | Reduction of body rocking did not generalize to nontreatment settings. |
| Aggression-disruption | 4/8 | D | Y | 4 | Reduction of noncompliance generalized to other familiar and unfamiliar tasks, and to nontreatment time periods; a nontarget aggressive behavior also was suppressed for one subject. |
| | | A[d] | Y | 1 | Hallucinations were reduced also in nontreatment situations. |
| | | D | N | 1 | Reduction of destructive behavior did not generalize to other persons or places. |
| | | D | N | 1 | Reduction of climbing did not generalize to absence of trainer, to home, or to a change in furniture in treatment setting. |
| Self injury | 5/13 | [e] | Y | 1 | Reduction of self-injury generalized to all new settings. |
| | | D | Y | 2 | Reduction in behavior generalized to other settings; reduction was seen also in nontargetted behaviors. |
| | | A | Y | 1 | Some generalization to nontreatment settings. |
| | | D | N | 2 | Self injury reduction did not generalize to waiting room adjacent to treatment setting. |
| | | D | N | 4 | Reduction of behavior did not generalize to nontreatment settings, trainers, or in absence of experimenter. |
| Adaptive | 0/2 | | | | |

[a] Data (D)/anecdotal (A) report. [b] Yes (Y), there was generalization; no (N), no generalization occurred. [c] Number of subjects participating in the study. [d] Self report by a subject.
[e] Could not be determined.

## Table 10
## Summary of Side Effects of Punishment

| | Number of studies | Description of side effects |
|---|---|---|
| Positive effects only | 11[a] | |
| Data based | 6 | Toileting behavior was maintained with DRO procedure alone.<br>Weight gain from treatment of rumination.<br>Correct responding or adaptive behavior increased with deceleration of stereotyped behavior. |
| Anecdotal | 5 | Spontaneous improvement in adaptive behavior, affection and attention given to others, and attention received from others.<br>Minimal amount of staff training was required.<br>A touch, instead of full restraint, was all that was needed by the study's end. |
| Negative effects only | 6 | |
| Data based | 3 | Increase in target behavior at onset of treatment. |
| Anecdotal | 3 | Screaming, running from trainer, hitting self, startle, soiling pants, covering ears, coughing, crying, violent head turning, struggling.<br>Fumes were irritating to trainers, scabs formed on subject's nose, mucous discharge from nose. |
| Positive & negative effects | 25[b] | |
| Data based positive | 4 | Weight gain from treatment of vomiting.<br>"No" became a conditioned punisher.<br>Increase in adaptive behavior when climbing behavior was reduced.<br>Reduction in other inappropriate behaviors and increases in adaptive behavior, smiles, babbling, and interaction, all as a result of treating rumination. |
| Anecdotal positive | 8 | Increase in adaptive behavior or learning after treatment of bruxism, stereotyped behavior, and self injury.<br>Therapists preferred restraint to overcorrection, and water mist to distasteful solutions.<br>Container for stimulus became conditioned punisher.<br>Verbal command became conditioned punisher.<br>Began to enjoy games, walks, and playground. |
| Data based negative | 4 | Increase in target behavior at onset of treatment.<br>Increase in similar nontarget behavior.<br>Increase in nontarget stereotyped and self-injurious behavior as rumination was treated.<br>Rapid increase when shock device malfunctioned.<br>Shock became less effective over time.<br>Unable to remove punisher stimulus without increases in self injury target behavior. |
| Anecdotal negative | 9 | Crying, struggling, resisting treatment, trunk twisting, arm flapping, leg extensions, grimacing, spitting, coughing, screaming, wincing, closing eyes, avoiding behavior, startle, hitting table. |

[a]Two studies reported both data-based and anecdotal information.

[b]Three studies reported both data-based positive and data-based negative side effects; one study reported both data-based positive and anecdotal negative side effects; seven studies reported both anecdotal positive and anecdotal negative side effects; one study reported anecdotal positive, data-based negative, and anecdotal negative side effects.

# Table 11
## Treatment of Adaptive Behavior by Negative Reinforcement [a]

| Article | Subjects N | Subjects Type | Target behavior | Description of treatment | Experimental design | Experimental conditions | Length of procedure | Length of session | Effectiveness of treatment | Effectiveness at follow-up (D/A) | Length of follow-up | Generalization (D/A) | Side effects (D/A) Positive | Side effects (D/A) Negative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lovaas et al. (1965) | 2 | Schizophrenic/ autistic | Come to trainer on request, Stereotyped behavior, tantrums | Electric shock to feet, "No" | Study 1, Subjects 1, 2: ABAC<br>Study 2, Subjects 1, 2: DEDEF | A = BL<br>B = shock + "No" (at onset of behavior or failure to respond to "come here")<br>C = noncontingent 2 sec. shock (once)<br>D = setting with no shock history<br>E = setting with shock history<br>F = condition B in setting D | 1. 3-5 sec.<br>2. 3-5 sec. | 1. 20 min.<br>2. 6 min. | 1. Immediate 0% to 60%-90% increase in response to command<br>2. Immediate 100% reduction in stereotyped and tantrum behavior<br>3. Immediate 0%-50% (Subject 1) and 0%-20% (Subject 2) increase in proportion of physical contact | 1. 80%-100% (D)<br>2. 100% reduction (D)<br>3. 60%-100% (D) | 10 mos.<br>10 mos.<br>10 mos. | Effects generalized to nontreatment settings for 1st few months, but eventually faded (A) | 1. "No" became conditioned punisher (D)<br>2. More alert and affectionate; happier; more seeking of trainer's company (A) | 1. Subjects immobilized in early sessions (A)<br>2. Fearful in early sessions (A) |
| Mithaug & Hanawalt (1977) | 1 | Severely mentally retarded | Task initiated response on prevocational task | Finger pressure to bicep, hand tap, verbal cue | Alternating blocks of treatment daily (ABC, BAC, ABC, ABAC, AC) | A = pressure<br>B = hand tap<br>C = verbal cue<br>(All conditions: hits sometimes blocked and hand placed in lap; fixed ratio of reinf.) | | 40 min. a day, 10-40 min. each condition | Responses per min. greater under A, increased 0-69 per min. in 14 days as time on task increased and as 2nd trainer added | | | | 1. Decrease in self biting and aggression (D)<br>2. Other trainers successfully implemented procedures (D) | |

## Table 11
(Continued)

| Article | Subjects N | Subjects Type | Target behavior | Description of treatment | Experimental design | Experimental conditions | Length of procedure | Length of session | Effectiveness of treatment | Effectiveness at follow-up (D/A) | Length of follow-up | Generalization (D/A) | Side effects (D/A) Positive | Side effects (D/A) Negative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mithaug (1976) | 1 | Severely mentally retarded | Compliance and appropriate task-related behaviors | Finger pressure to neck, reinforcement | ABCD | A = pressure + reinf. + prevent mouthing/ pocketing<br>B = pressure + reinf. + 1 hand in pocket<br>C = both hands on table<br>D = new trainer + both hands on table + reinf. | | 20 min. | Consistent 1.0-1.5 movements per-min. across all conditions | | | Generalization to 1 other person (D) | 100% reduction in other inappropriate (D) | Unmanageable in condition A (A, D) |
| Altman & Krupsaw (1982) | 1 | Moderately developmentally delayed | Eye contact | Head holding, reinf. | Multiple BL across 4 tasks | A = reinf.<br>B = reinf. + head holding | 3.4 sec. (mean) | 10 min. | Percentage of time samples showing eye contact doubled - tripled in 3 days | | | | | Struggling to escape head hold, emotional behavior (A) |

[a]N = number; D/A = data (D)/anecdotal (A) report; BL = baseline; sec. = seconds; min. = minutes; mos. = months; reinf. = reinforcement.

## Table 12
## Summary of Effectiveness of Overcorrection as Reported by Foxx and Bechtel (1983)

| Effectiveness | Tolleting | | Inappropriate oral | | Stereotyped | | Aggression-Disruption | | Self-injury | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Studies | Subjects | Studies | Subjects | Studies | Subjects | Studies | Subjects | Studies | Subjects | Studies | Subjects |
| OC decreased target behavior | | | | | | | | | | | | |
| Near 100%/100% | 0 | 0 | 3 | 6 | 8 | 15 | 7 | 58 | 7 | 9 | 25 | 88(42%)[a] |
| 90%-99% | 1 | 12 | 1 | 1 | 1 | 1 | 2 | 30 | 1 | 1 | 6 | 45(21%) |
| 80%-89% | 1 | 5 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 2 | 7(3%) |
| Other | 1[b] | 1 | 0 | 0 | 1[c] | 2 | 0 | 0 | 1[d] | 4 | 4 | 10(5%) |
| | | | | | 1[e] | 3 | | | | | | |
| OC + other method decreased target behavior | | | | | | | | | | | | |
| Near 100%/100% | 2[f] | 2 | 2[g] | 3 | 4[h] | 14 | 3[i] | 8 | 1[f] | 2 | 12 | 29(14%) |
| 90%-99% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1[j] | 11 | 1 | 11(5%) |
| 80%-89% | 1[f] | 9 | 0 | 0 | 1[f] | 4 | 0 | 0 | 0 | 0 | 2 | 13(6%) |
| Other | 0 | 0 | 1[k] | 5 | 0 | 0 | 0 | 0 | 1[l] | 2 | 2 | 7(3%) |
| Total | 6 | 29 | 7 | 15 | 17 | 41 | 12 | 96 | 12 | 29 | 54 | 210 |
| Comparison of procedures | | | | | | | | | | | | |
| Methods found more effective than OC alone | | | | | 1[m] | 1 | | | | | 1 | 1 |
| DRO | | | | | | | 2[n] | 3 | | | 2 | 3 |
| Punishment | | | | | | | | | 1 | 2 | 1 | 2 |
| OC + reinforcement | | | | | | | | | | | | |
| OC alone found more effective than | | | | | | | | | | | | |
| Loss of recess | | | | | | | 1 | 6 | | | 1 | 6 |
| Timeout or physical restraint | | | | | | | 1 | 2 | | | 1 | 2 |
| Verbal warnings | | | | | 1 | 2 | 1 | 1 | | | 2 | 3 |
| DRO or slap or distasteful substance | | | | | 1 | 2 | | | | | 1 | 2 |
| Timeout | | | 1 | 1 | | | | | | | 1 | 1 |
| Physical restraint | | | 1 | 4 | | | | | | | 1 | 4 |
| Combination of procedures | | | | | | | | | | | | |
| OC + DRO better than DRO + EXT | | | 1 | 1 | | | | | | | 1 | 1 |
| OC + satiation better than satiation | | | 1 | 2 | | | | | | | 1 | 2 |
| OC + DRI better than DRI | | | | | 3 | 21 | | | | | 3 | 21 |
| OC + reinforcement better than reinforcement | | | | | 2 | 2 | | | | | 2 | 2 |
| OC + DRO + satiation better than DRO | | | | | | | 1 | 6 | | | 1 | 6 |
| OC + DRO better than DRO | | | | | | | 2 | 2 | | | 2 | 2 |

[a] Percentage of all 210 subjects. [b] Dryness increased. [c] 0% for Subject 1, 100% for Subject 2. [d] Near 100% for 3/4 subjects. [e] Range of 33%-95%. [f] OC plus reinforcement. [g] OC plus DRO; OC plus satiation. [h] OC plus DRI; OC plus reinforcement; OC plus verbal warning. [i] DC plus DRO; OC plus DRO plus satiation; OC plus reinforcement. [j] OC plus reinforcement plus feedback. [k] OC plus reinforcement; dryness increased. [l] OC plus DRI; 100% reduction for Subject 1, 0% for Subject 2. [m] DRO, 81%; OC, 54%. [n] Ammonia, social.

## Table 13
**Efficiency of Use of Overcorrection Procedures as Reported by Foxx and Bechtel (1983)**

| | Toileting | Inappropriate oral | Stereotyped | Aggression-disruption | Self injury | Adaptive behavior |
|---|---|---|---|---|---|---|
| Time needed to reduce behavior (hours) | | | | | | |
| Range of all studies | 8-480 | 1-96 | 1-48 | 2-280 | 1-56 | No data |
| Mean time per subject | 190 | 52 | 17 | 33 | 35 | |
| Length of overcorrection procedure (length is in minutes unless noted otherwise) | | | | | | |
| Range of all studies | 10-45 | 1.5-60 | .5-20 | .2-120 | .05-140 | 2-30 |
| | | 50 cycles | | 3 cycles | 12-20 cycles | 3-25 cycles |
| Mean length per subject | 36 | 21 | 8 | 20 | 40 | 10 |
| | | | | | | 7.5 cycles |

## Table 14
## Summary of Maintenance of Overcorrection Effects as Reported by Foxx and Bechtel (1983)

| Treatment category | Proportion of studies with maintenance information | Maintained | | | Not maintained | | |
|---|---|---|---|---|---|---|---|
| | | D/A[a] | Months[b] | Subjects[c] | D/A | Months | Subjects |
| Toileting | 6/6 | A,D | 5 | 9 | | | |
| | | D | 3 | 12 | | | |
| | | D | 7 | 1 | | | |
| | | A | 5 | 1 | | | |
| | | A | 6 | 1 | | | |
| | | A | 7.5 | 5 | | | |
| Inappropriate oral | 5/7 | D | 12 | 1 | | | |
| | | D | 3 | 1 | | | |
| | | D | 3 | 1 | | | |
| | | D | 6 | 4/5 maintained | | | |
| | | A,D | 4 | 2 | | | |
| Stereotyped | 8/19 | D | 1-3 | 4 | D | 6 | 2 |
| | | D | 3.5 | 1 | | | |
| | | ? | 1.5 | 4 | | | |
| | | D | 12 | 2/8 maintained | | | |
| | | D | 12 | 1 | | | |
| | | D | 2 | 3 | | | |
| | | D | 5.5 | 1 | | | |
| Aggression-disruption | 8/14 | D | 7 | 22 | | | |
| | | D | 6 | 6 | | | |
| | | D | 12 | 1 | | | |
| | | D | 18 | 1 | | | |
| | | D | 6 | 1 | | | |
| | | A | 12 | 6 | | | |
| | | A | 6 | 6 | | | |
| | | A | 2 | 1 | | | |
| Self injury | 8/12 | D | 21-33 | 4 | A | 6 | 1 |
| | | D | 4 | 2 | | | |
| | | D | 6 | 1 | | | |
| | | A | 9 | 1 | | | |
| | | A | 9[d] | 2 | | | |
| Adaptive | 2/7 | D | 4 | 5 | | | |
| | | A | 2 | 1 | | | |

[a] Data(D)/anecdotal(A) report. [b] Length of follow-up in months. [c] Number of subjects participating in the study. [d] Required brief retreatment.

## Table 15
## Summary of Generalization Effects of Overcorrection as Reported by Foxx and Bechtel (1983)

| Treatment category | Proporion of studies with generalization information | Generalization | | Subjects[b] | Description of results |
|---|---|---|---|---|---|
| | | D/A[a] | Yes(Y)/No(N) | | |
| Toileting | 0/6 | | | | |
| Inappropriate oral | 2/7 | D | Y | 2 | Rumination declined at nontreatment meals. |
| | | A | Y | 1 | Effects generalized to two nontreatment settings. |
| Stereotyped | 8/19 | D | Y | 1 | Three nontarget behaviors decreased. |
| | | D | Y | 3 | Slight decrease of nontarget behavior. |
| | | D | Y | 1 | Head turning decreased in two nontreatment settings. |
| | | D | Y | 1 | Mouthing decreased in a nontreatment setting. |
| | | A | Y | 1 | Transferring objects hand to hand decreased in nontreatment setting. |
| | | D | N | 1 | Treatment of hand and body movements failed to generalize. |
| | | A | N | 4 | Treatment of mouthing, head weaving, and hand clapping failed to generalize. |
| | | A | N | 2 | Treatment of head weaving, head nodding, self hitting, and rocking failed to generalize. |
| Aggression-disruption | 2/15 | D | Y | 1 | Treatment of scavenging behavior generalized to nontreatment setting. |
| | | D | Y | 1 | Treatment of inappropriate sexual behavior generalized to new trainers. |
| Self-injury | 6/12 | D | Y | 1 | Treatment of eye poking generalized to a nontreatment setting. |
| | | D | Y | 1 | Treatment of head banging and hand biting generalized to a nontreatment setting. |
| | | A | Y | 1 | Treatment of eye poking, hand biting, and object breaking generalized to a nontreatment setting. |
| | | A | Y | 1 | Treatment of eye gouging generalized to a nontreatment setting. |
| | | D | Y/N | 1 | Treatment of pinching generalized to two similar nontreatment settings, but failed to generalize to a dissimilar nontreatment setting. |
| | | D | N | 1 | Treatment of hand mouthing and hand biting failed to generalize to new settings. |
| Adaptive | 3/7 | A | Y | For 1 of 2 subjects | Work and compliance behaviors generalized to nontreatment behaviors. |
| | | A | Y | 5 | Physical and verbal sharing generalized to a nontreatment setting. |
| | | A | Limited | 1 | Speech and imitative behavior showed limited generalization to nontraining settings, behaviors, and trainers. |

[a] Data(D)/anecdotal(A) report. [b] Number of subjects participating in the study.

## Table 16
## Summary of Side Effects of Overcorrection as Reported by Foxx and Bechtel (1983)

| | Number of studies | Description of side effects |
|---|---|---|
| Positive effects only | 6 | |
| Data based | 1 | Slight increase in appropriate play with materials as a result of treating stereotyped behavior. |
| Anecdotal | 5 | Increased personal care skills, increases in appropriate classroom behavior, spontaneous emission of some overcorrection behaviors, subject and staff preference for overcorrection versus other procedures. |
| Negative effects only | 10 | |
| Data based | 4 | Increase in the targeted self-injurious behaviors, increase in nontargeted inappropriate behavior. |
| Anecdotal | 6 | Crying and tantruming, aggression, increase in nontargeted inappropriate behaviors, active resistance by subjects, and abandonment of procedure by staff because it was too labor intensive. |
| Positive & negative effects | 12 | |
| Data based positive | 5 | Staff preference of overcorrection versus time out or medication, discharge of clients from treatment program, increase in appropriate toy play. |
| Anecdotal positive | 7 | Increased interaction with staff and peers, increased attention to teachers and materials, decreased aggression toward staff and peers,independent proper "vomiting," increase in self-help skills. |
| Data based negative | 3 | Increase in nontargeted stereotyped behavior, physical resistance. |
| Anecdotal negative | 9 | Aggression toward others, emotional behavior, active or passive resistance, increase in targeted self-injurious behavior, increased agitation, escape behavior. |